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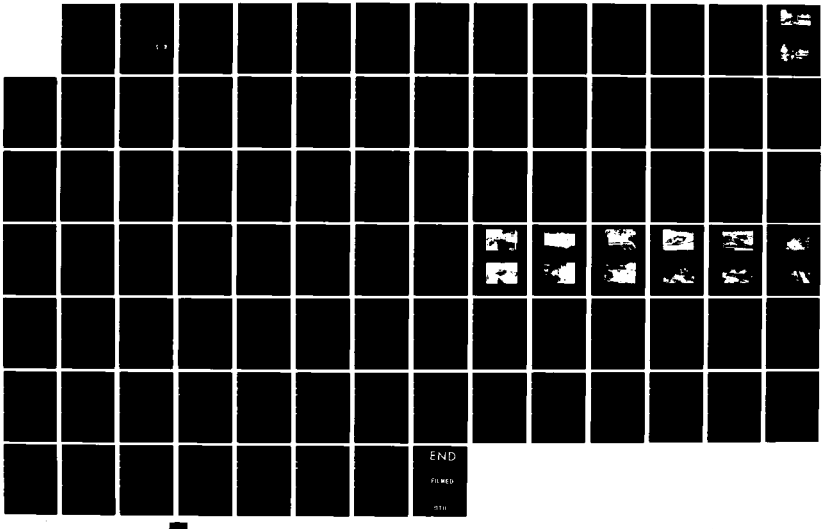
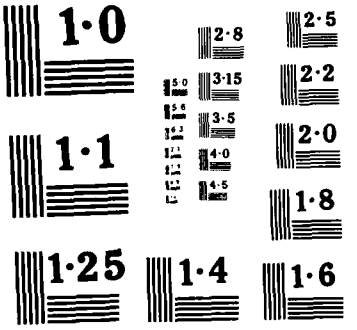


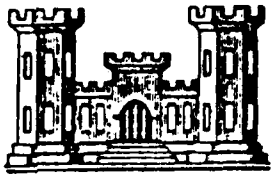


(2)

TAUNTON RIVER BASIN
BROCKTON, MASSACHUSETTS

LOWER PORTER POND DAM
MA 00424

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

JANUARY 1980

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18. SUPPLEMENTARY NOTES

Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,
Taunton River Basin
Brockton, Massachusetts
Beaver Brook

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Lower Porter Dam is an ill- defined earth embankment about 200 ft. long with a maximum height of about 12 ft. and a top width averageing 15 ft. The dam appears to be in fair condition. With a classification size of small and a hazard potential of significant, the recommended range for test flood is ½ og the Probable Maximum Flood. The owner should implement various operat' nal and maintenance procedures.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED

MAY 19 1980

Honorable Edward J. King
Governor of the Commonwealth of
Massachusetts
State House
Boston, Massachusetts 02133

Dear Governor King:

Inclosed is a copy of the Lower Porter Pond Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Quality Engineering, the cooperating agency for the Commonwealth of Massachusetts. In addition, a copy of the report has also been furnished the owner, the city of Brockton.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Quality Engineering for your cooperation in carrying out this program.

Sincerely,

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

LOWER PORTER POND DAM

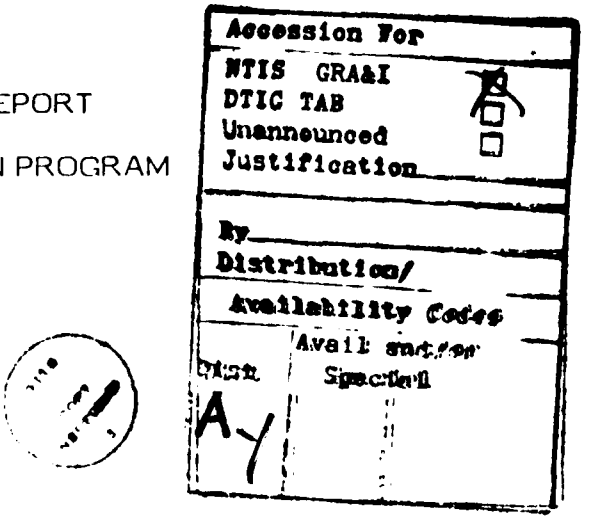
MA 00424

TAUNTON RIVER BASIN

BROCKTON, MASSACHUSETTS

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM



NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

Indentification No.:	MA 00424
Name of Dam:	Lower Porter Pond Dam
Town:	Brockton
County and State:	Plymouth, Massachusetts
Stream:	Beaver Brook
Date of Inspection:	October 17, 1979

BRIEF ASSESSMENT

Lower Porter Pond Dam is an ill-defined earth embankment approximately 200 feet long with a maximum height of about 12 feet and a top width averaging 15 feet. The upstream slope, which is capped with a 2-foot high parapet wall, is unknown and the downstream slope is about 2H:1V. The broad-crested stone masonry service spillway is located near the right abutment. The broad-crested stone masonry auxiliary spillway is situated about 60 feet to the right of the service spillway. The dam was constructed in 1940 for the City of Brockton park development program and is currently used for recreational purposes.

The dam appears to be in fair condition. Roots of large trees growing on the dam crest may increase the seepage potential and high winds may dislodge the trees removing significant portions of embankment material. The absence of grass cover on a portion of the dam crest exposes the embankment to undesirable surface erosion.

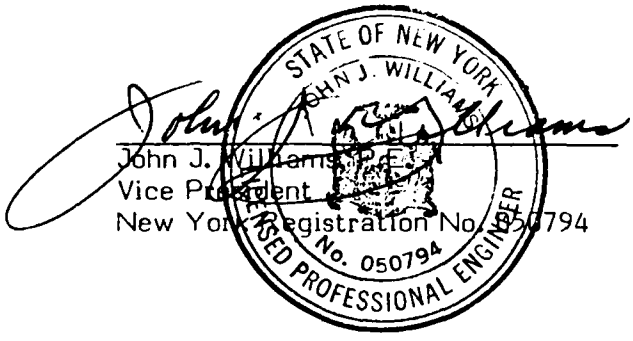
Lower Porter Pond Dam has a maximum storage capacity of approximately 54 acre-feet and a maximum height of about 12 feet. Therefore, the dam is classified in the "Small" size category. Approximately 35 inhabitable structures are located downstream of Thirty Acre Pond, which is located immediately downstream of Lower Porter Pond. A densely populated urban neighborhood is located further downstream. A failure of Lower Porter Pond dam could cause appreciable property damage but little or no loss of life in the downstream communities. Therefore, the dam is classified in the "Significant" hazard category. The recommended range for the test flood for a "Small size, "Significant" hazard dam is from the 100-year flood to one-half of the Probable Maximum Flood (PMF). The selected test flood for this structure is one-half of the PMF.

The test flood peak inflow to Lower Porter Pond was computed as 2,510 cfs. The routed test flood outflow of 2,505 cfs overtops the embankment by 1.2 feet. The spillway system is capable of discharging 488 cfs prior to overtopping of the embankment, which is about 19 percent of the routed test flood outflow.

Within one year after receipt of the Phase I inspection report, the Owner, the City of Brockton, should retain the services of a registered professional engineer, experienced in the design and construction of dams, for the following purposes: (1) detailed hydrologic and hydraulic analyses should be performed to assess the need for increasing the project discharge capacity; and (2) a study should be made to examine the possibility of Waldo Lake (upstream of Lower and Upper Porter Pond) overflowing the area along the D.W. Field East Parkway and to evaluate the consequences of such an occurrence; (3) the trees and their root systems should be removed from the embankment to the extent possible and the voids in the embankment backfilled with appropriate compacted embankment materials; and (4) the seismic stability of the dam should be investiaged.

In addition, the Owner should implement the following operational and maintenance procedures: (1) the bare spots on the embankment crest should be covered with suitable vegetation and protected from pedestrian traffic; (2) erosion protection should be provided for the upstream slope of the embankment; (3) the operating condition of the pond drain sluice gate should be determined and the gate should be repaired if necessary; (4) a program of annual periodic technical inspection should be instituted; and (5) a formal surveillance and flood warning plan, including round-the-clock monitoring during heavy precipitation, should be developed.

O'BRIEN & GERE ENGINEERS, INC.



John J. Williams, P.E.
Vice President
New York Registration No. 050794

Date 22 FEB 1980

This Phase I Inspection Report on Lower Porter Pond Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

RICHARD DIBUONO, MEMBER
Water Control Branch
Engineering Division

ARAMAST MAHTESIAN, MEMBER
Foundation & Materials Branch
Engineering Division

CARNEY M. TERZIAN, CHAIRMAN
Design Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of theses guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation: however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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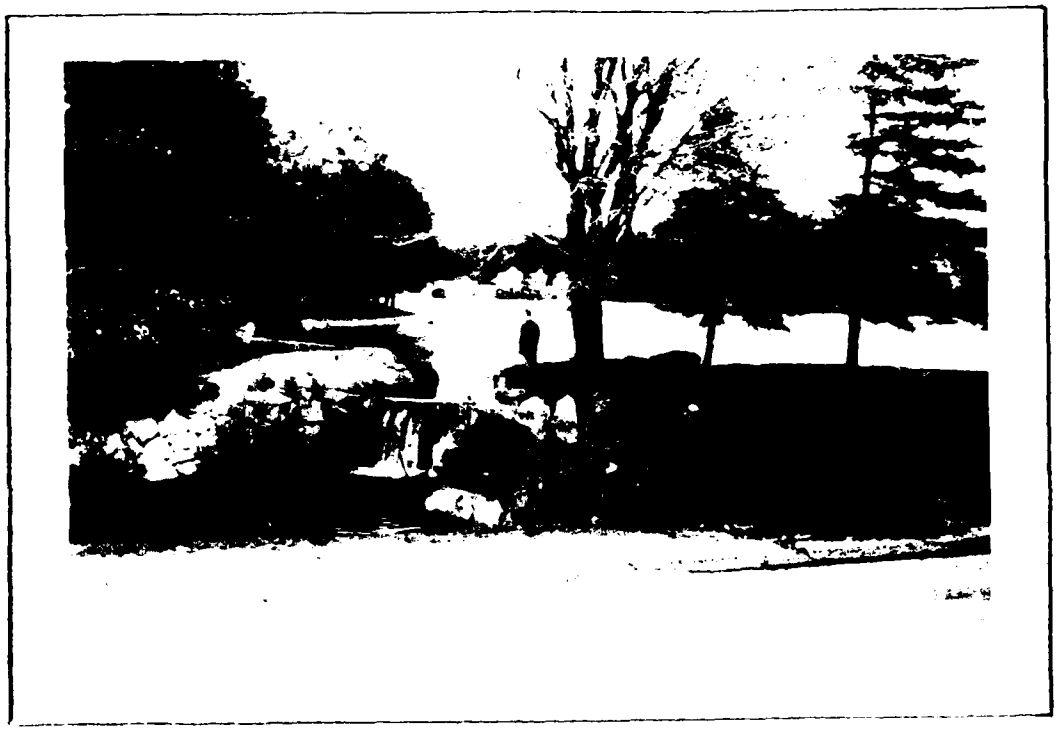
APPENDICES



UPSTREAM OVERVIEW OF THE LOWER PORTER POND DAM. (10/17/79)

DOWNSTREAM OVERVIEW OF THE LOWER PORTER POND DAM. (10/17/79)

SECTION 7

ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. The visual observations and review of the available information indicate that Lower Porter Pond Dam is in fair condition. The roots of trees growing on the dam crest may increase the seepage potential and high winds may dislodge the trees removing significant portions of embankment material. The absence of grass cover on a portion of the dam crest exposes the embankment to undesirable surface erosion.

The test flood peak inflow to Lower Porter Pond was computed as 2,510 cfs. The routed test flood outflow of 2,505 cfs overtops the embankment by 1.2 feet. The spillway system is capable of discharging 488 cfs prior to overtopping of the embankment, which is about 19 percernt of the routed test flood outflow. A failure of the dam would cause a rise in stream elevation of approximately 1.1 feet at the downstream damage area which could result in appreciable property damage but little or no loss of life.

b. Adequacy of Information. The available information together with the visual inspection data are adequate for a Phase I assessment of Lower Porter Pond Dam.

c. Urgency. Further investigations and remedial measures should be implemented within one year of receipt of this Phase I Inspection Report.

7.2 Recommendations

The following recommendations should be implemented by a registered professional engineer experienced in the design and construction of dams.

1) Detailed hydrologic and hydraulic analyses should be performed to assess the necessity for increasing the project discharge capacity.

2) It appears that Waldo Lake, upstream of Lower and Upper Porter Pond, could overflow in the area along the D. W. Field East Parkway prior to overtopping the dam crest. A study should be made to examine this possibility and to evaluate the consequences of such an occurrence.

3) The trees and their root systems should be removed from the embankment to the extent possible and the voids in the embankment replaced with appropriate compacted embankment materials.

4) The seismic stability of the dam should be investigated utilizing conventional equivalent static load methods.

SECTION 6

STRUCTURAL STABILITY

6.1 Visual Observations

The roots of trees growing on the dam crest could provide increased seepage potential through the embankment. High winds could dislodge the trees and their root systems causing significant losses of embankment material. The roots of the deciduous tree growing within two feet of the eastern service spillway training wall may destroy the masonry joint material and cause dislocation of individual stones. The loss of grass cover on the dam crest exposes the embankment to surface erosion which might lead to a reduction of the effective top of dam elevation.

6.2 Design and Construction Data

No information was available concerning stability analyses, seepage computations, or embankment and foundation material properties.

6.3 Post Construction Changes

No post construction changes have been performed at this site.

6.4 Seismic Stability

Lower Porter Pond Dam is located in Seismic Zone 3 on the "Seismic Zone Map of Contiguous States." Therefore, according to the Recommended Guidelines for Safety Inspection of Dams, a seismic stability analysis should be performed as recommended in Section 7.

the east of Waldo Lake, noted in paragraph 5.1, were not included in the routing procedures.

The test flood peak inflow to Lower Porter Pond was computed as 2,510 cfs. The routed test flood outflow of 2,505 cfs overtops the embankment by 1.2 feet. The spillway system is capable of discharging 488 cfs prior to overtopping of the embankment, which is about 19 percent of the routed test flood outflow.

5.5 Dam Failure Analysis

A failure of the embankment was simulated by the HEC-1-DB computer program assuming a 20-foot wide and 7-foot deep breach with vertical side slopes developing within one hour. The failure is assumed to occur with the reservoir surface at the top of dam elevation. The resulting outflow was routed to the damage center, which was assumed to be the community of approximately 35 homes downstream of Thirty Acre Pond. The channel cross-section utilized in the computer program for the hazard area was taken at a point 1,200 feet downstream of Thirty Acre Pond and is shown on page D-12. The increase in stream depth at this location was computed to be 1.1 feet. This depth of flow could cause appreciable property damage and little or no loss of life in the downstream damage center.

SECTION 5

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

Lower Porter Pond Dam has an elongated watershed about 4 miles long and 0.9 miles wide. The drainage area is wooded with some residential developments and low-lying marshes in the upper reaches. The topography ranges from Elev. 250 to Elev. 160 at the normal pool surface. There are three impoundments upstream of Lower Porter Pond: Brockton Reservoir, Waldo Lake and Upper Porter Pond. The normal pool storage capacities of these three impoundments are about 190, 180 and 28 acre-feet, respectively. It was noted during the visual inspection that the area east of Waldo Lake may be lower in elevation than the top of the dam, thus forming a saddle about 2,000 feet long. Therefore, large inflows into Waldo Lake might be diverted over this saddle into the adjacent watershed. This would in turn reduce the impact of the selected test flood upon Lower Porter Pond Dam and its downstream hazard area.

5.2 Design Data

Neither hydraulic nor hydrologic design data are available for Lower Porter Pond Dam.

5.3 Experience Data

There are no records of high reservoir pools or dam overtoppings at this site.

5.4 Test Flood Analysis

The recommended test flood range for a "Small" size, "Significant" hazard dam is from the 100-year flood to one-half of the Probable Maximum Flood (PMF). Due to the potential for property damage and the possibility of loss of life (although remote) in the downstream damage center, the selected test flood is one-half of the PMF.

Hydrologic and hydraulic calculations were performed with the assistance of the HEC-1-DB computer program. The flood hydrographs were constructed from the Snyder unit hydrographs using average coefficients, an initial infiltration of zero and a constant loss rate of 0.05 inches per hour. The Hop Brook Adjustment Factor was used to reduce the Probable Maximum Precipitation based on the drainage area. The routing sequence consisted of dividing the watershed into sub basins for each impoundment and routing the inflow hydrographs through each reservoir. Stage vs. discharge and stage vs. storage relationships above the spillway crest and the top of the dam were developed for all five dams in the system to obtain outflow hydrographs. All impoundments were assumed to be at their respective spillway crest elevations at the beginning of the storm event. Possible overflow effects to

SECTION 4

OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures

a. General. Based upon information supplied by the City of Brockton and the Massachusetts DEQE, and that obtained through subsequent conversations with Mr. John Dorgan Sr., Park Commissioner, no formal operating procedures have been established for operation of Lower Porter Pond Dam.

b. Description of Any Warning System in Effect. According to Mr. Dorgan, no flood warning system is in effect for Lower Porter Pond Dam.

4.2 Maintenance Procedures.

a. General. According to Mr. Dorgan, the grass on the embankment crest is cut on a regular basis during the growing season.

b. Operating Facilities. According to Mr. Dorgan, the outlet conduit sluice gate is operable and no formal maintenance program is in effect at this site.

4.3 Evaluation

There are no operational procedures in effect at this site. Recommendations for improving these conditions are given in Section 7.3.

missing at the time of inspection. The outlet end of this pipe appeared to be free of debris and was partially submerged.

d. Reservoir Area. The area surrounding the pond consists primarily of well-maintained grass areas which slope gradually up from the edge of the pond. Portions of the surrounding area are forested.

e. Downstream Channel. The stilling basin, which accepts discharge from both spillways and the outlet conduit, is lined with hand-placed riprap and is reported to be about four feet deep. There is no evidence of excessive erosion or displacement of the stone lining around the basin. The pool elevation in the basin was the same as that of Thirty Acre Pond at the time of inspection. The parkway bridge openings were clear of debris and the bridge itself appeared to be in good condition.

3.2 Evaluation.

The dam is considered to be in fair condition. Bare spots on the crest of the dam and lack of erosion protection on the upstream slope could lead to surface erosion of the embankment. The roots of the trees growing from the crest create potential seepage paths through the dam. In the event of severe winds uprooting the trees, portions of the embankment could be dislodged. Both spillways appear to be in satisfactory condition.

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General. The field inspection of Lower Porter Pond Dam was performed on October 17, 1979. At the time of the inspection, the reservoir water surface was about 2 inches above the spillway crest. No underwater areas were inspected.

The observations and comments of the field inspection team are in the checklist which is Appendix A of this report.

b. Dam. The dam is considered to be in fair overall condition. The visible portions of the upstream slope below reservoir level appear to grade very gently away from the spillway wingwalls and the vertical stone wall curbing. There is no evidence of riprap on the submerged slope. The masonry wingwalls and parapet wall appear to be in good condition. The embankment crest width varies from 15 to 20 feet and is grass covered. Bare earth is exposed parallel to the eastern service spillway training wall (see overview photo). It was observed that the left abutment area extends to the east of the embankment for a distance of at least 300 feet with the same elevation as the dam crest. A deciduous tree about forty feet tall and two smaller evergreens are growing on the dam crest. The downstream slope supports shrubs and flowers planted as part of a park beautification program. There was no evidence of seepage on the date of the inspection.

c. Appurtenant Structures. The broad-crested masonry service spillway located at the right abutment appears to be in fair condition. The masonry walls of the approach channel have a slope of 1H:1V and show little evidence of deterioration. The center five feet of the masonry weir crest is depressed about 3 inches below the remaining length of weir. It could not be determined if this section was constructed in this manner or if there is settlement of the spillway headwall.

The broad-crested auxiliary spillway is located about 60 feet northwest of the service spillway. The weir crest is composed of non-mortared loose stone and has a non-uniform surface elevation. The vertical non-mortared training walls are in good condition. It was noted that discharge was flowing between the large cobbles forming the downstream end of the weir crest. The downstream channel invert is less than one foot below the poorly defined weir crest and is composed of the same cobble size material. A low-lying area west of the auxiliary spillway appears to function as a stilling pool during high spillway discharges. The unlined outlet channel downstream of the stilling pool is trapezoidal in section and contains three one foot drops of non-mortared stone construction. Undermining of the left side of the outlet channel has created a vertical side wall about 3 feet high.

A 30-inch diameter pre-cast concrete outlet pipe is located about 10 feet west of the service spillway. The sluice gate is submerged and the operator was

SECTION 2

ENGINEERING DATA

2.1 Design

The following information was made available for review of Lower Porter Pond Dam:

1. Report entitled "Master Plan Study for D. W. Field Park," April 1968 prepared by Camp, Dresser and McKee, Boston, Massachusetts.

2. Dam inspection report prepared by Commonwealth of Massachusetts, Department of Environmental Quality and Engineering (DEQE), December, 1972.

3. Dam inspection report prepared by the County of Plymouth, Engineering Department, February, 1942.

4. Drawing entitled "Proposed Location and Design for Permanent Structures at Easton Dam" dated April, 1940.

Note 1: No design calculations, embankment cross-sections, or record drawings are available for this site.

Note 2: The principal design features for this dam are shown on the sketches enclosed in Appendix B.

2.2 Construction

No information is available concerning construction of Lower Porter Pond Dam except that it was part of the Works Progress Administration program in 1940.

2.3 Operation

No operational data is available for this site.

2.4 Evaluation

a. Availability. The information made available was obtained from the City of Brockton and the DEQE.

b. Adequacy. The drawing and reports together with the visual inspection data are adequate for a Phase I Investigation.

c. Validity. The data obtained for this site is in general conformance with the field measurements.

h. Diversion and Regulating Tunnel.

Not applicable.

i. Spillway.

Type (Service)	Broad-crested masonry weir
(Auxiliary)	Broad-crested loose stone weir
Length (Service)	12 feet
(Auxiliary)	20 feet
Crest Elevation (Service)	160.0
(Auxiliary)	160.0
Gates	None
Upstream Channel (Service)	11 feet long, masonry invert 12 feet wide, grouted stone side-slopes.
(Auxiliary)	None
Downstream Channel (Service)	Stilling basin & Thirty Acre Pond
(Auxiliary)	Stilling pool, trapezoidal drop sections, stilling basin & Thirty Acre Pond.

j. Regulating Outlets. A hand-operated sluice gate of unknown dimensions is situated at the upstream end of a 30 inch diameter pre-cast concrete outlet pipe. The gate invert elevation is approximately 154.0 MSL and is considered to be at or near the bottom of Lower Porter Pond.

c. Elevation. (feet above NGVD)

Streambed at Toe of Dam	151.0
Bottom of Cutoff	NA
Maximum Tailwater	158+
Normal Pool	160.0
Full Flood Control Pool	NA
Spillway Crest (Service and Auxiliary)	160.0
Design Surcharge (Original Design)	Unknown
Top of Dam	163.0
Test Flood Pool Design Surcharge	164.2

d. Reservoir. (Length in feet)

Normal Pool	900
Flood Control Pool	NA
Spillway Crest Pool	900
Top of Dam	920
Test Flood Pool	950

e. Storage. (Acre-feet)

Normal Pool	24
Flood Control Pool	NA
Spillway Crest Pool	24
Top of Dam	54
Test Flood Pool	69

f. Reservoir Surface. (Acres)

Normal Pool	8
Flood Control Pool	NA
Spillway Crest	8
Top of Dam	12
Test Flood Pool	14

g. Dam.

Type	Earth embankment
Length	200 feet
Height	12 feet
Top Width	15-20 feet
Side Slopes (upstream)	Unknown earth slope below the water capped with a parapet wall.
(downstream)	2H:1V
Zoning	Unknown
Impervious Core	Unknown
Cutoff	Unknown
Grout Curtain	Unknown

g. Purpose of Dam. The dam was constructed and is presently used for recreational purposes.

h. Design and Construction History. Lower Porter Pond Dam, originally called Easton Dam, was constructed in 1940 as part of the Works Projects Administration (WPA) program. Further information is unavailable.

i. Normal Operating Procedures. The reservoir is normally self-regulating with the normal pool slightly above the crest elevation of the service and auxiliary spillways.

1.3 Pertinent Data

a. Drainage Area. The watershed for Lower Porter Pond Dam is approximately 3.4 square miles in area and is wooded with some residential developments and low-lying marshes in the upper reaches. Three reservoirs (Brockton Reservoir, Waldo Lake, and Upper Porter Pond) are located upstream of Lower Porter Pond within the drainage area.

b. Discharge at Damsite.

1) Outlet Works. The outlet works consists of a gated 30-inch diameter pre-cast concrete pipe with an invert elevation of 154.0 MSL. The estimated discharge capacity is about 25 cfs when the reservoir surface is at the top of the dam.

2) Maximum Known Flood at Damsite. Unknown.

3) Ungated Spillway Capacity at Top of Dam. The combined discharge capacity of the service and auxiliary spillways with reservoir at top of dam Elev. 163.0 is 488 cfs.

4) Ungated Spillway Capacity at Test Flood Elevation. The combined spillway capacity with reservoir at test flood Elev. 164.2 is about 720 cfs.

5) Gated Spillway Capacity at Normal Pool. Not applicable.

6) Gated Spillway capacity at Test Flood Elevation. Not applicable.

7) Total Spillway Capacity at Test Flood Elevation. Same as 4) above.

8) Total Project Discharge at Top of Dam. Same as 3) above.

9) Total Project Discharge at Test Flood. The combined discharge capacity of the spillways and the flow over the dam at test flood Elev. 164.2 is 2,500 cfs.

b. Description of Dam and Appurtenances. Lower Porter Pond Dam is an ill-defined earth embankment approximately 200 feet long with a maximum height of about 12 feet. The top width is approximately 15 feet and the downstream slope is about 2H:1V. The upstream slope is unknown and is capped with a two-foot high parapet wall.

The broad-crested stone masonry service spillway is located near the right abutment. The trapezoidal approach apron is eleven feet long and consists of a masonry invert with grouted stone side slopes. The spillway has a 12-foot long weir and a 9-foot high vertical downstream headwall. Discharge over the service spillway is directed into a riprapped stilling basin and then into Thirty Acre Pond through a double arch reinforced concrete highway bridge. Each arch has a clear opening about 10 feet wide and 7 feet high.

The broad-crested stone masonry auxiliary spillway is situated about 60 feet to the right of the service spillway. The spillway is 20 feet long with vertical masonry training walls and a dumped rock invert. The initial outlet channel elevation is about one foot below the weir crest. The channel slopes gently downstream and outlets into a shallow stilling pool. The channel is constructed downstream of the stilling pool as a series of trapezoidal drop sections for a distance of approximately 50 feet where discharges from the auxiliary spillway are conveyed into the service spillway stilling basin.

c. Size Classification. Lower Porter Pond Dam has a maximum storage capacity of approximately 54 acre-feet and a maximum height of about 12 feet. The criteria for the "Small" size category includes dams which have less than 1,000 acre-feet storage capacity and are less than 40 feet high. Lower Porter Pond Dam is therefore classified as a "Small" size dam.

d. Hazard Classification. Lower Porter Pond Dam is located approximately 70 feet upstream of Thirty Acre Pond. Approximately 35 single family dwellings and commercial establishments are downstream of Thirty Acre Pond. In addition, the discharge from Thirty Acre Pond passes through two small ponds, a narrow man-made channel approximately one mile long and into a 1,800-foot long underground culvert. The region of potential flooding which borders the man-made channel and which is upstream of the culvert is a densely populated urban neighborhood. The dam is classified as "Significant" hazard since flood waters resulting from failure at Lower Porter Pond Dam could cause appreciable property damage but little or no loss of life. This assessment is based on the breach analysis, which computed a stream depth of 1.1 feet at the initial downstream damage center.

e. Ownership. The dam is owned by the City of Brockton, Department of Parks and Recreation, City Hall, Brockton, Massachusetts, 02401, Telephone 617-580-1100.

f. Operator. The dam is operated by the Department of Parks and Recreation. Mr. John Dorgan Sr., Park Commissioner, is in charge of dam operations. Telephone 617-580-1100.

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT
LOWER PORTER POND DAM

SECTION 1

PROJECT INFORMATION

1.1 General

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspections throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. O'Brien & Gere Engineers, Inc. has been retained by the New England Division to inspect and report on selected dams in the Commonwealth of Massachusetts. Authorization and notice to proceed were issued to O'Brien & Gere Engineers, Inc. by a letter from the Corps of Engineers dated November 6, 1979 and signed by Colonel William E. Hodgson, Jr. Contract No. DACW33-80-C-0014 has been assigned by the Corps of Engineers for this work.

b. Purpose. The purpose of performing technical inspection and evaluation of non-federal dams is to:

1. Identify conditions which threaten public safety and make the Owner aware of any deficiencies to permit him to correct them in a timely manner.

2. Encourage and prepare the states to initiate effective dam safety programs for non-federal dams.

3. Update, verify, and complete the National Inventory of Dams.

1.2 Description of Project (Information for this dam was obtained from the City of Brockton and the Massachusetts Department of Environmental Quality and Engineering (DEQE).

a. Location. Lower Porter Pond Dam is located on Beaver Brook within the City of Brockton, Massachusetts. A 35-home community located about 0.5 miles downstream is considered the major damage center. Beaver Brook outlets into Salisbury Brook about 0.75 miles downstream and Salisbury Brook joins Trout Brook to form the Salisbury Plain River about 2 miles downstream of the dam. The dam is shown on the USGS Quadrangle entitled "Brockton, Massachusetts" at coordinates N 42^{o} 05.9', W 71^{o} 02.6'. A regional location plan of Lower Porter Pond Dam is enclosed as Figure 1, pg. vi.

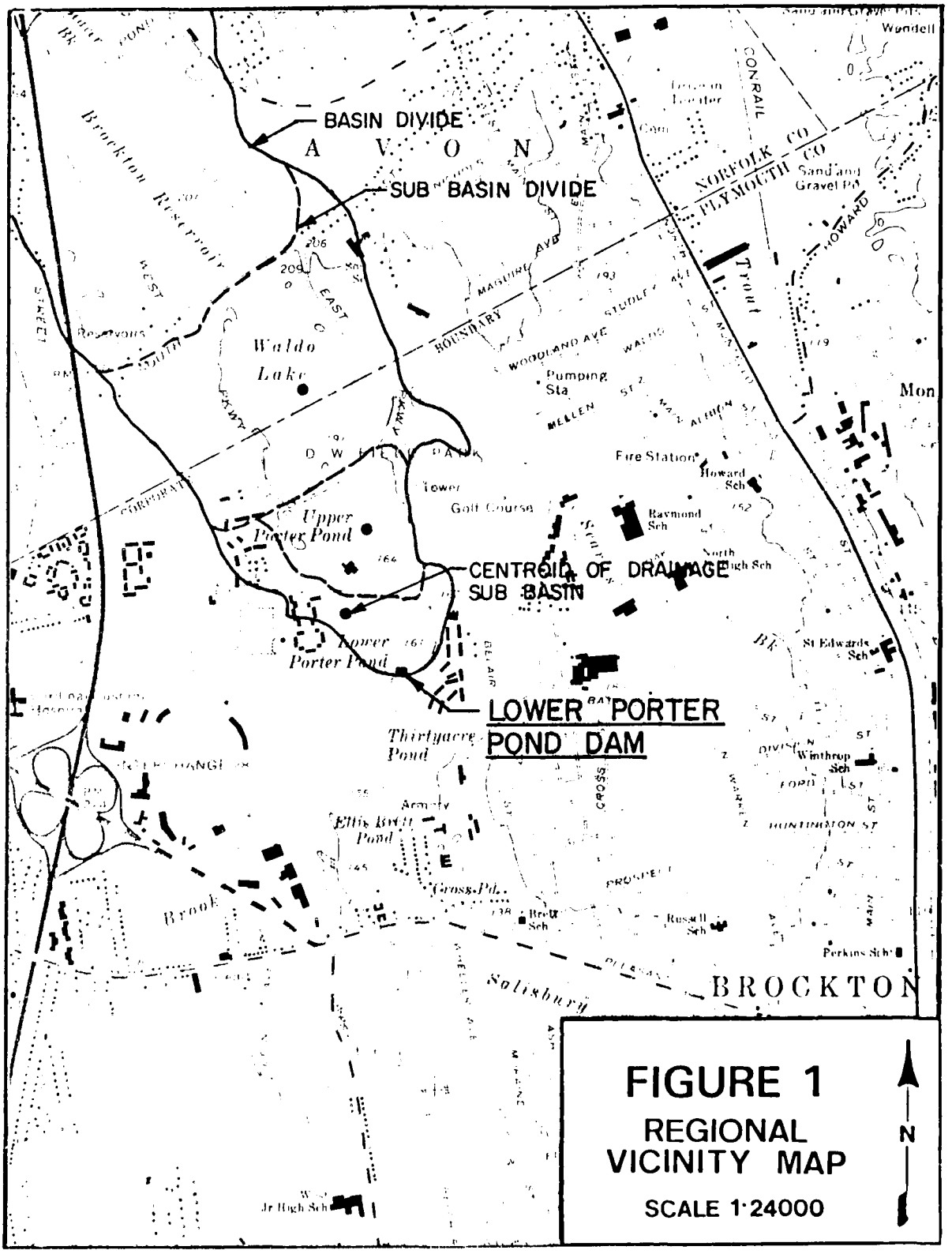


FIGURE 1

REGIONAL VICINITY MAP

SCALE 1:24000

7.3 Remedial Measures

1) The bare spots on the embankment crest should be covered with suitable vegetation and protected from pedestrian traffic.

2) Erosion protection should be provided for the upstream slope of the embankment.

3) The operating condition of the pond drain sluice gate should be determined and the gate should be repaired, if necessary. The gate operator should be stored in a convenient location for emergency use.

4) A program of annual periodic technical inspection should be instituted.

5) A formal surveillance and flood warning plan, including round-the-clock monitoring during heavy precipitation, should be developed.

7.4 Alternatives

As an alternative to the above recommendations and remedial measures, the dam could be breached and the pond drained.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECK LIST

INSPECTION TEAM ORGANIZATION

Project: LOWER PORTER POND DAM

National I.D. #: MA 00424

Location: Brockton, MA

Type of Dam: Earth Embankment

Inspection Date(s): October 17, 1979

Weather: Overcast, 47°

Pool Elevation: 160.2 MSL

Inspection Team

Leonard Beck	O'Brien & Gere	Structures
Steven Snider	O'Brien & Gere	Foundations & Materials
Alan Hanscom	O'Brien & Gere	Structures
Rodney Georges	Bryant & Associates	Hydrology/Hydraulics

*Mr. John J. Williams, Vice-President, O'Brien & Gere has visited the site but not necessarily in conjunction with the inspection team.

Owner's Representative

Mr. John Dorgan, Park Commissioner, D.W. FIELD PARK

Brockton MA

VISUAL INSPECTION CHECK LIST

Project: LOWER PORTER POND DAM

National I.D. #: MA 00424

Date(s): October 17, 1979

AREA EVALUATED	CONDITIONS
DAM EMBANKMENT	
Crest Elevation	160.0 MSL
Current Pool Elevation	160.2 MSL
Maximum Impoundment to Date	Uknown.
Surface Cracks	None.
Pavement Condition	N/A
Movement or Settlement of Crest	None.
Lateral Movement	None.
Vertical Alignment	Good.
Horizontal Alignment	Good.
Condition at Abutment and at Concrete Structures	No problems noted.
Indications of Movements of Structural Items on Slopes	None.
Trespassing on Slopes	Bare ground on embankment crest near spillway.
Vegetation on Slopes	Flowers and small shrubs on d/s slope; part of beautification prog.
Sloughing or Erosion of Slopes or Abutments	None.
Rock Slope Protection - Riprap Failures	None.

VISUAL INSPECTION CHECK LIST

Project: LOWER PORTER POND DAM

National I.D. #: MA 00425

Date(s): October 17, 1979

AREA EVALUATED	CONDITIONS
DAM EMBANKMENT (Con't)	
Unusual Movement or Cracking at or near Toes	None.
Unusual Embankment or Downstream Seepage	None.
Piping or Boils	None.
Foundation Drainage Features	None.
Toe Drains	None.
Instrumentation System	None.

VISUAL INSPECTION CHECK LIST

Project: LOWER PORTER POND DAM

National I.D. #: MA 00425

Date(s): October 17, 1979

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS SERVICE SPILLWAY	
a. Approach Channel	
General Condition	Fair.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	None.
Floor of Approach Channel	Grouted stones in good condition.
b. Weir and Training Walls	
General Condition of Concrete	Depression in stone masonry spillway headwall.
Rust or Staining	N/A.
Spalling	None.
Any Visible Reinforcing	None.
Any Seepage or Efflorescence	None.
Drain Holes	None.
c. Discharge Channel	
General Condition	Good. Riprapped stilling basin & Thirty Acre Pond.

VISUAL INSPECTION CHECK LIST

Project: LOWER PORTER POND DAM

National I.D. #: MA 00425

Date(s): October 17, 1979

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS (Con't)	
SERVICE SPILLWAY	
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	None.
Floor of Channel	Unknown. Submerged.
Other Obstructions	R/C double arch bridge about 45' d/s of Service Spillway.

VISUAL INSPECTION CHECK LIST

Project: LOWER PORTER POND DAM

National I.D. #: MA 00425

Date(s): October 17, 1979

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS AUXILIARY SPILLWAY	
a. Approach Channel	
General Condition	Poor.
Loose Rock Overhanging Channel	None.
Trees Overhanging Channel	None.
Floor of Approach Channel	Dumped stone.
b. Weir and Training Walls	
General Condition of Concrete	Vertical stone masonry walls in good condition. Irregular stone crest.
Rust or Staining	None.
Spalling	Some loss of mortar.
Any Visible Reinforcing	None.
Any Seepage or Efflorescence	None.
Drain Holes	None.
c. Discharge Channel	
General Condition	Fair. Some erosion of left channel bank.

VISUAL INSPECTION CHECK LIST

Project: LOWER PORTER POND DAM

National I.D. #: MA 00425

Date(s): October 17, 1979

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS (Con't)	
Loose Rock Overhanging Channel	Some at bank undermining.
Trees Overhanging Channel	One deciduous tree at location of undermining.
Floor of Channel	Dumped stone w/three stone masonry steps.
Other Obstructions	None.

VISUAL INSPECTION CHECK LIST

Project: LOWER PORTER POND DAM

National I.D. #: MA 00425

Date(s): October 17, 1979

AREA EVALUATED	CONDITIONS
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	
Slope Conditions	Submerged.
Bottom Conditions	Submerged.
Rock Slides or Falls	None.
Log Boom	N/A
Debris	None.
Condition of Concrete Lining	Unknown.
Drains or Weep Holes	None.
b. Intake Structure - OPEN AIR GATE VALVE	
Condition of Concrete	Masonry headwall in good condition.
Stop Logs and Slots	None.
Sluice Gate	Operator missing. Unknown if operable according to owner's representative.

VISUAL INSPECTION CHECK LIST

Project: LOWER PORTER POND DAM

National I.D. #: MA 00425

Date(s): October 17, 1979

AREA EVALUATED	CONDITIONS
OUTLET WORKS - TRANSITION AND CONDUIT	
General Condition of Concrete	N/A
Rust or Staining on Concrete	N/A
Spalling	N/A
Erosion or Cavitation	None.
Cracking	None.
Alignment of Monoliths	N/A
Alignment of Joints	N/A
Numbering of Monoliths	N/A
Condition of Outlet Conduit	PCCP outlet in good condition. Partially submerged by stilling basin.

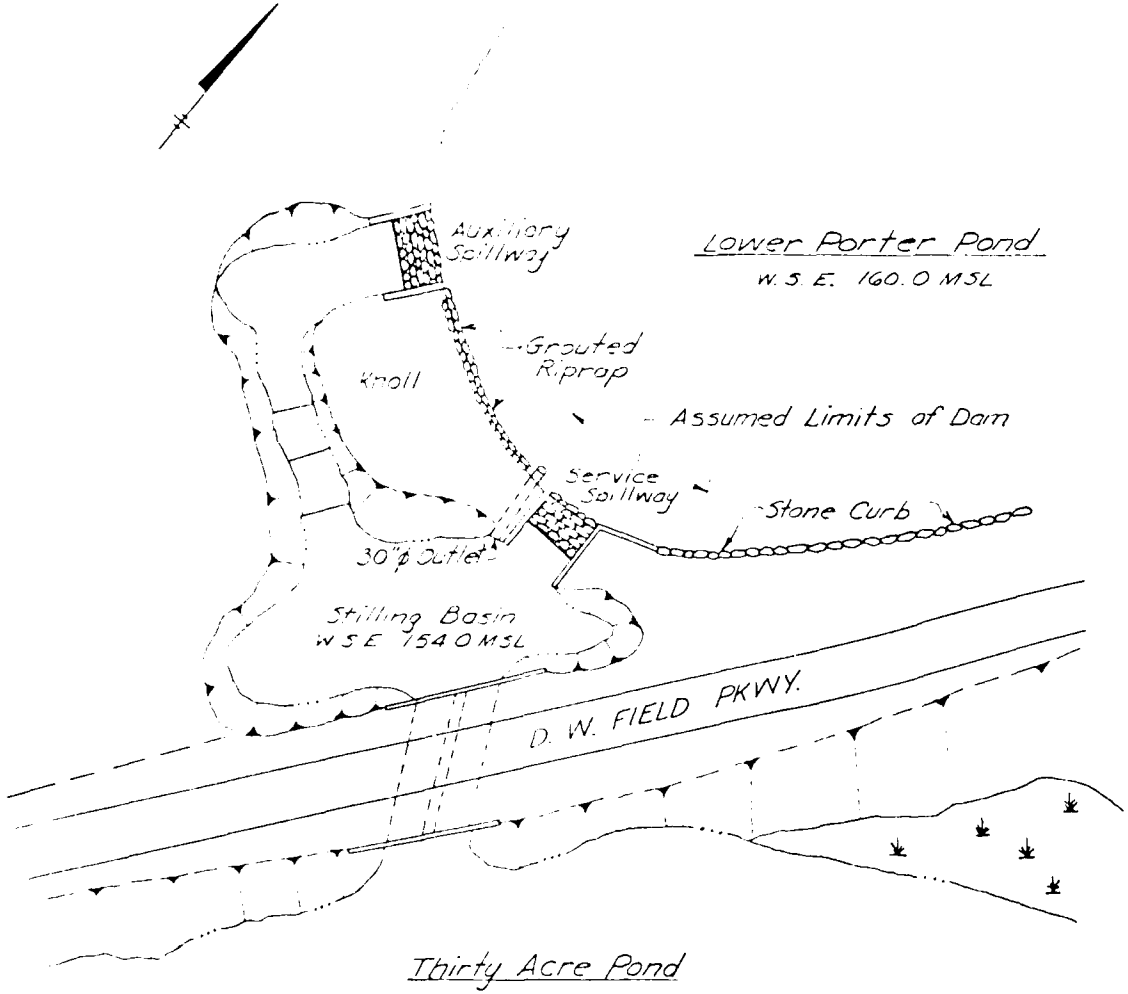
APPENDIX B

ENGINEERING DATA

APPENDIX B

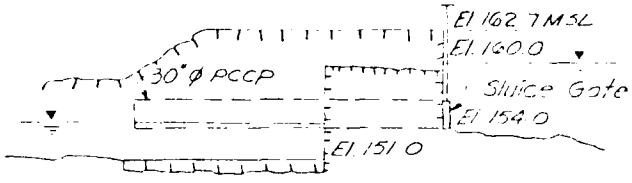
ENGINEERING DATA

TABLE OF CONTENTS

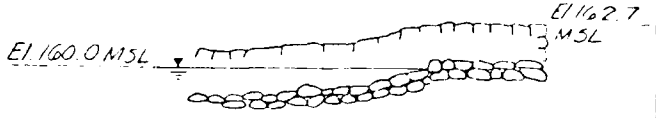


Lower Porter Pond
W. S. E. 160.0 MSL

Thirty Acre Pond
W S E. 154.0 MSL



SERVICE SPILLWAY SECTION

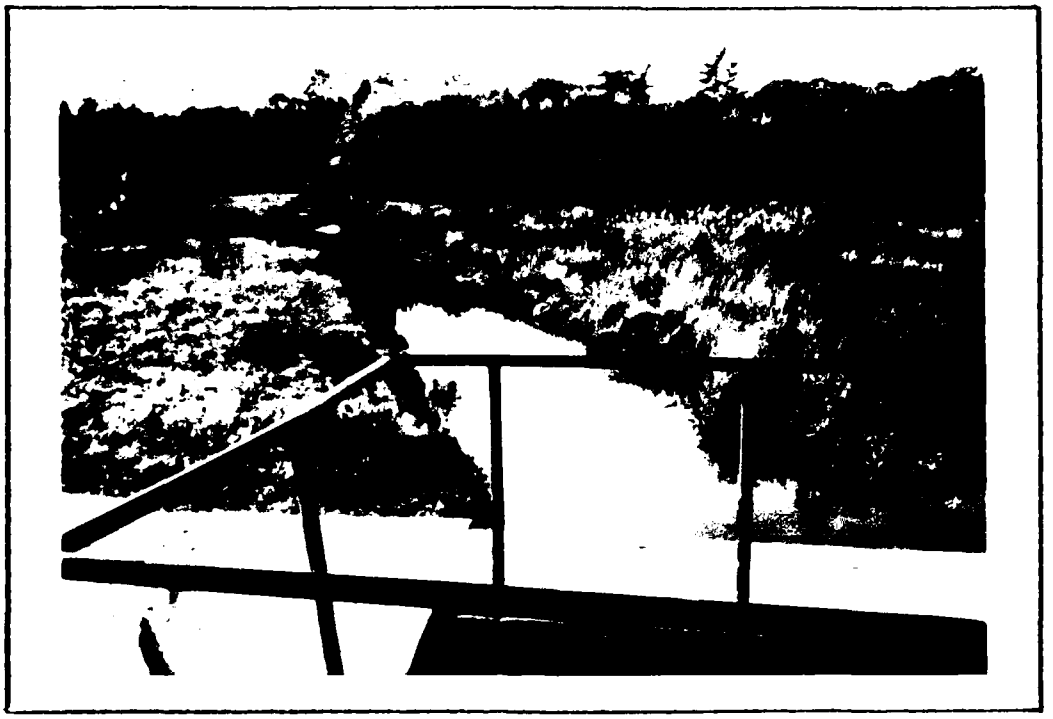


AUXILIARY SPILLWAY SECTION

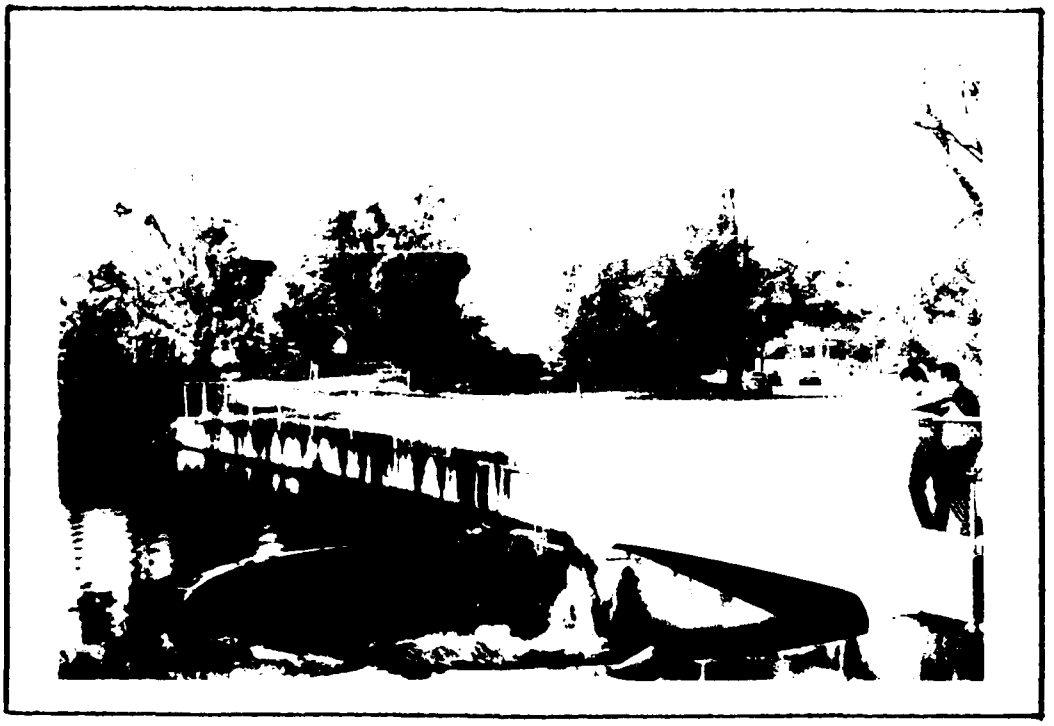
U S ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		
Contract No. DACW 33-80-C-0014 LOWER PORTER POND DAM		
SITE PLAN & SPILLWAY SECTIONS		
OBRIEN & GERE	DATE JANUARY 1980 SCALE NONE	8 - 1

11. TYPICAL REACH OF SALISBURY BROOK ABOUT 1½ MILES DOWNSTREAM OF LOWER PORTER POND DAM. (10/17/79)

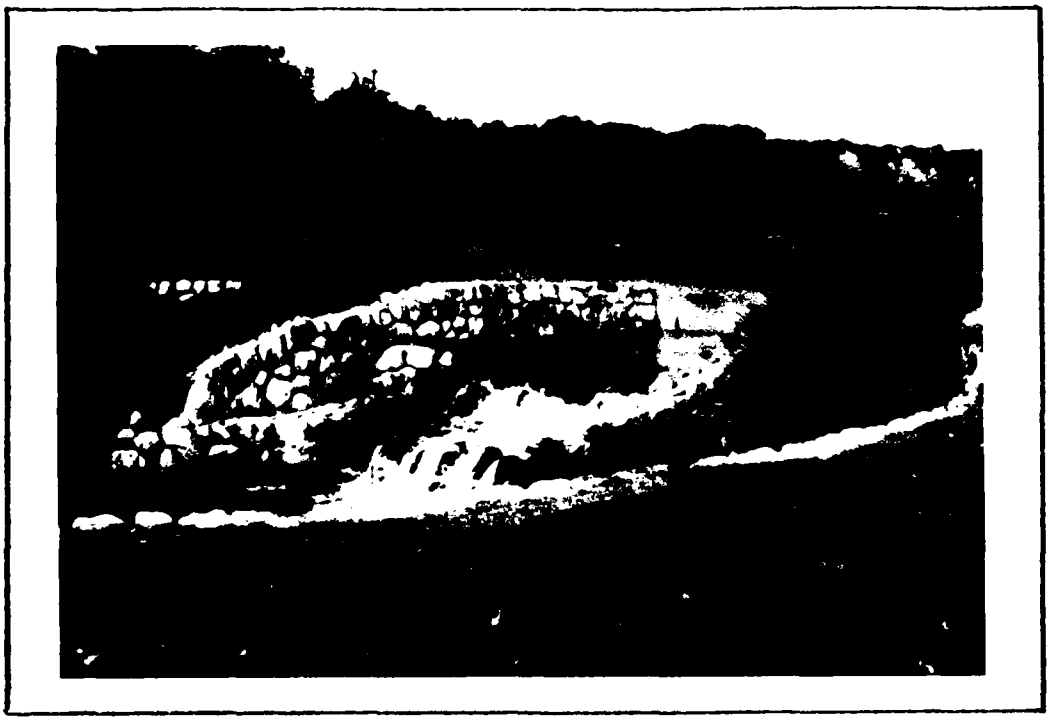
12. ENTRANCE TO APPROXIMATELY 600 YARD LONG BOX CULVERT FOR SALISBURY BROOK IN BROCKTON ABOUT ONE AND 3/4 MILES DOWNSTREAM OF LOWER PORTER POND DAM. (10/17/79)



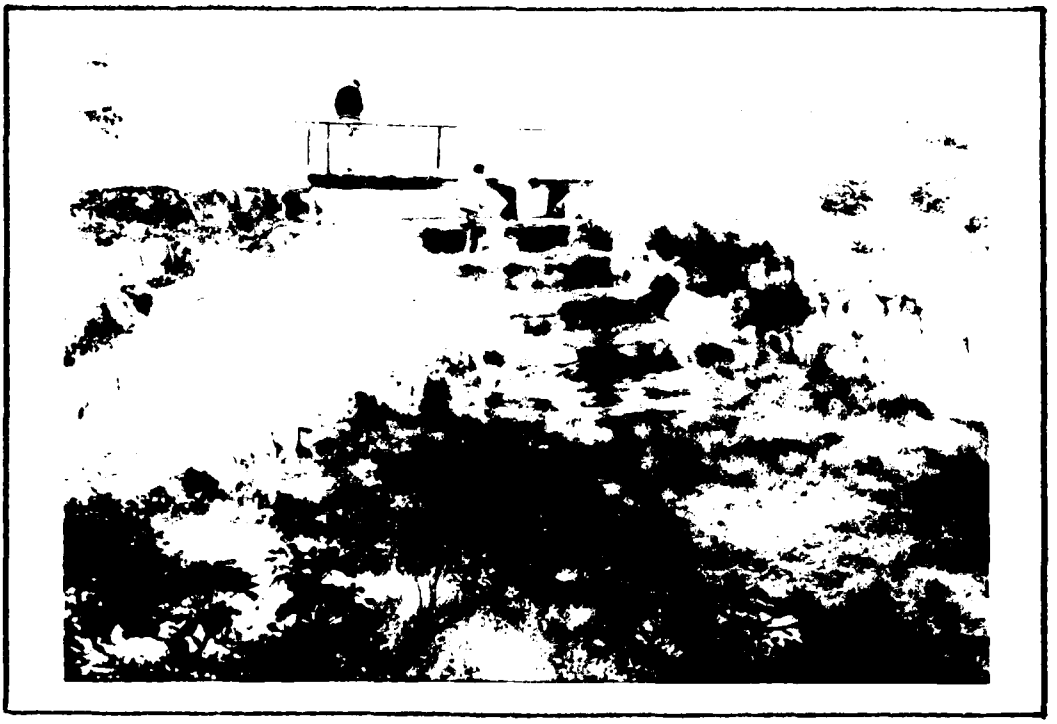
9. E. BRETT POND (DRAINED) INLET STRUCTURE ABOUT 1150 YARDS DOWNSTREAM OF LOWER PORTER POND DAM. (10/17/79)



10. CROSS POND SPILLWAY APPROXIMATELY 1450 YARDS DOWNSTREAM OF LOWER PORTER POND DAM. (10/17/79)



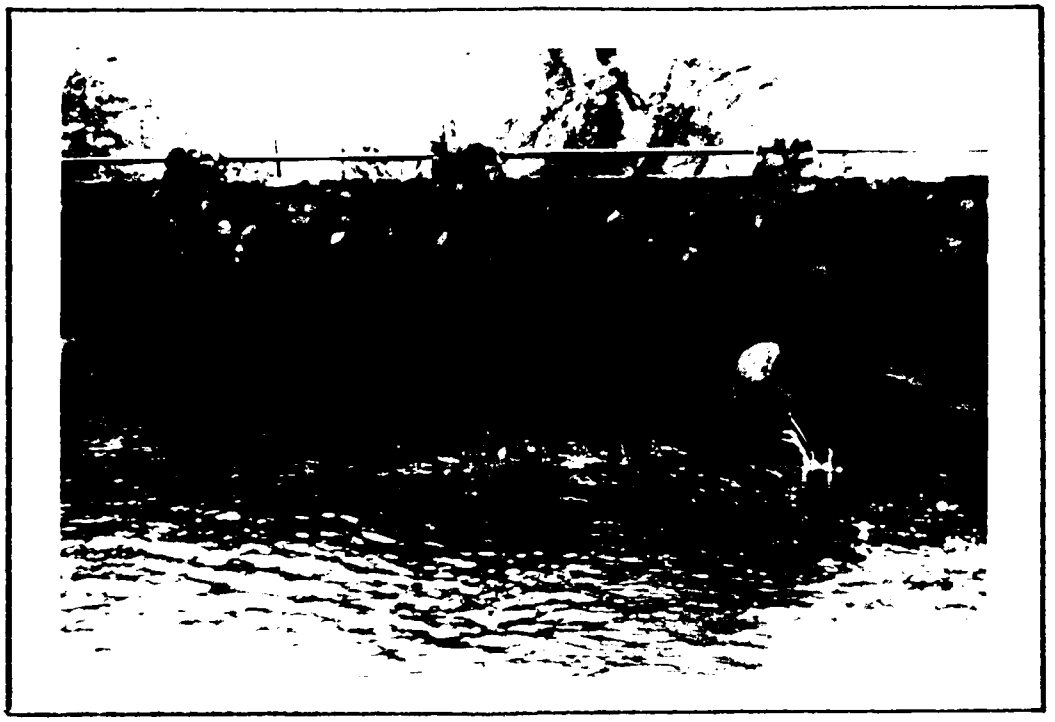
7. UPPER PORTER POND DAM SPILLWAY APPROXIMATELY 350 YARDS UPSTREAM OF LOWER PORTER POND DAM. (10/17/79)



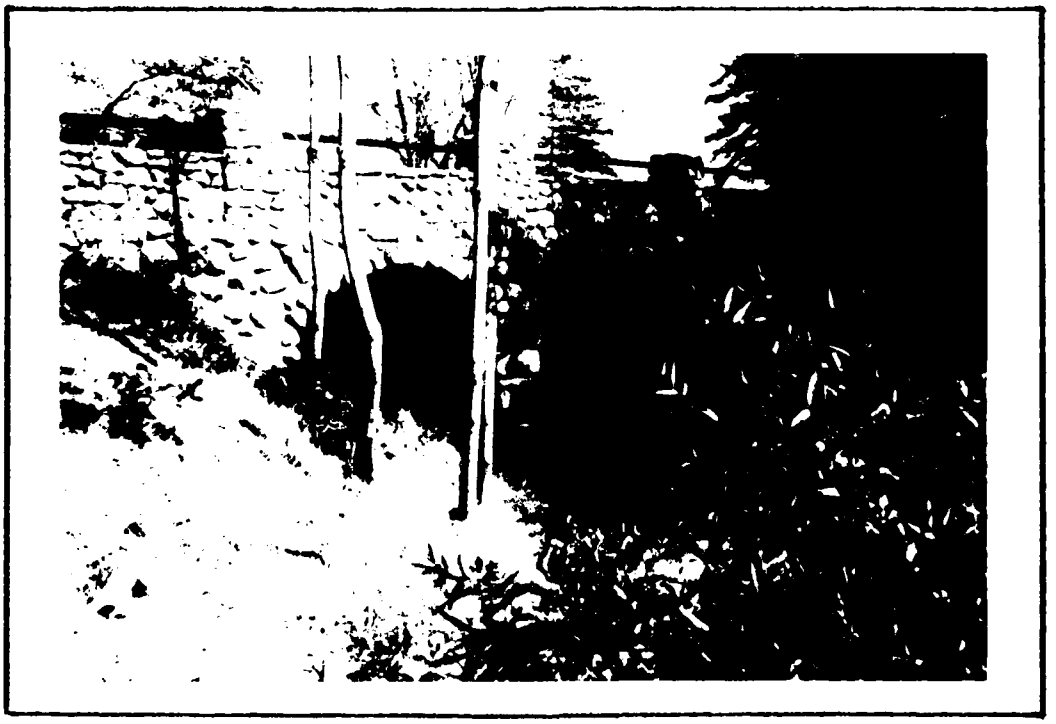
8. 30 ACRE POND DAM SPILLWAY ABOUT 700 YARDS DOWNSTREAM OF LOWER PORTER POND DAM. (10/17/79)

5. BROCKTON RESERVOIR DAM SPILLWAY APPROXIMATELY 2100 YARDS UPSTREAM OF LOWER PORTER POND DAM. (10/17/79)

6. WALDO LAKE DAM SPILLWAY ABOUT 1050 YARDS UPSTREAM OF LOWER PORTER POND DAM. (10/17/79)



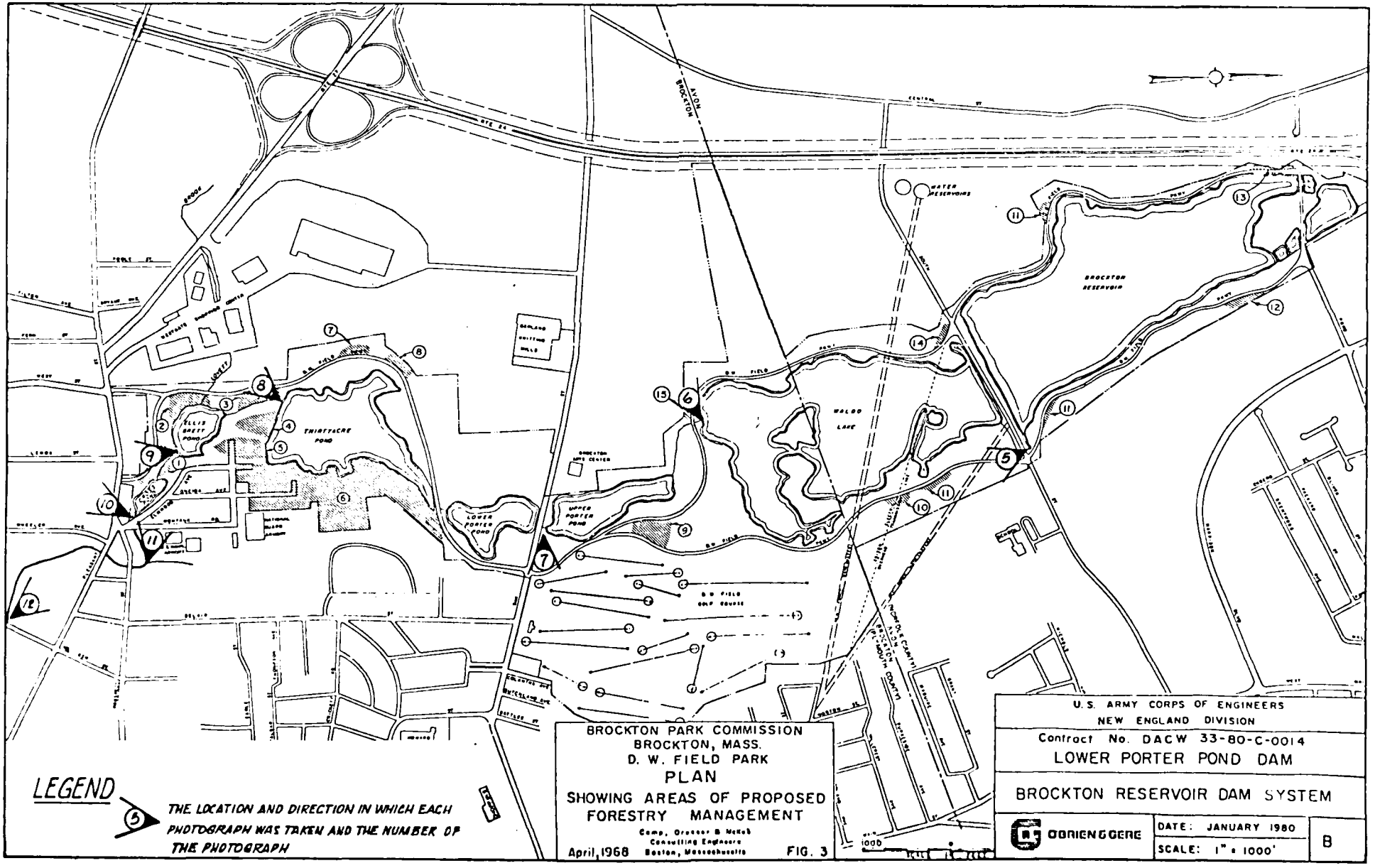
3. BRIDGE APPROXIMATELY 50 FEET DOWNSTREAM OF THE SERVICE SPILLWAY AND 150 FEET DOWNSTREAM OF THE AUXILARY SPILLWAY. (10/17/79)

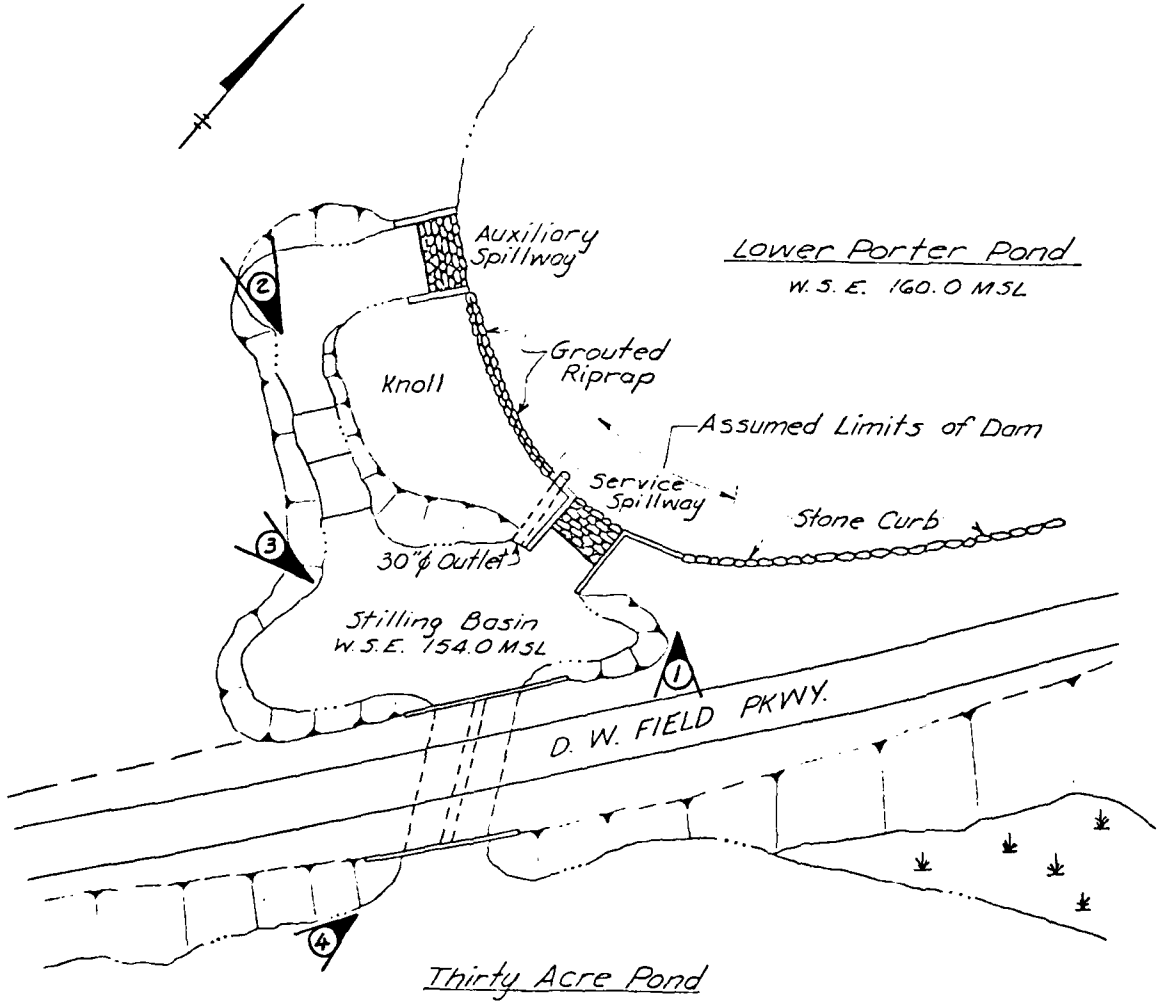


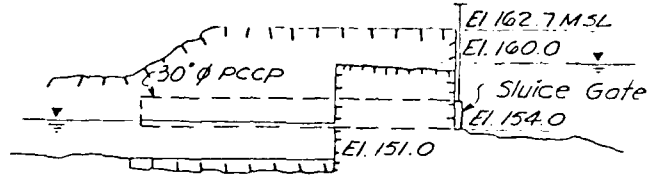
4. CHANNEL DOWNSTREAM OF THE BRIDGE WHICH IS DOWNSTREAM OF THE IMPOUNDMENT.(10/17/79)

1. SERVICE SPILLWAY LOOKING UPSTREAM TOWARD THE IMPOUNDMENT. (10/17/79)

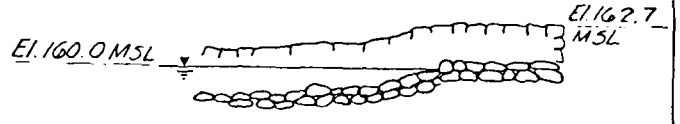
2. AUXILARY SPILLWAY OUTLET CHANNEL LOOKING DOWNSTREAM. (10/17/79)


LEGEND
THE LOCATION AND DIRECTION IN WHICH EACH PHOTOGRAPH WAS TAKEN AND THE NUMBER OF THE PHOTOGRAPH
BROCKTON PARK COMMISSION
BROCKTON, MASS.
D. W. FIELD PARK
PLAN
SHOWING AREAS OF PROPOSED
FORESTRY MANAGEMENT
Camp, Dresser & McKee
Consulting Engineers
Boston, Massachusetts
April, 1968
FIG. 3
U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DIVISION
Contract No. DACW 33-80-C-0014
LOWER PORTER POND DAM
BROCKTON RESERVOIR DAM SYSTEM
GOODIER & GERE
DATE: JANUARY 1980
SCALE: 1" = 1000'
B





SERVICE SPILLWAY SECTION



AUXILIARY SPILLWAY SECTION

LEGEND

(1) THE LOCATION AND DIRECTION IN WHICH EACH PHOTOGRAPH WAS TAKEN AND THE NUMBER OF THE PHOTOGRAPH

U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DIVISION

Contract No. DACW 33-80-C-0014

LOWER PORTER POND DAM

SITE PLAN &
SPILLWAY SECTIONS

O'BRIEN & GERE

DATE: JANUARY 1980

SCALE NONE

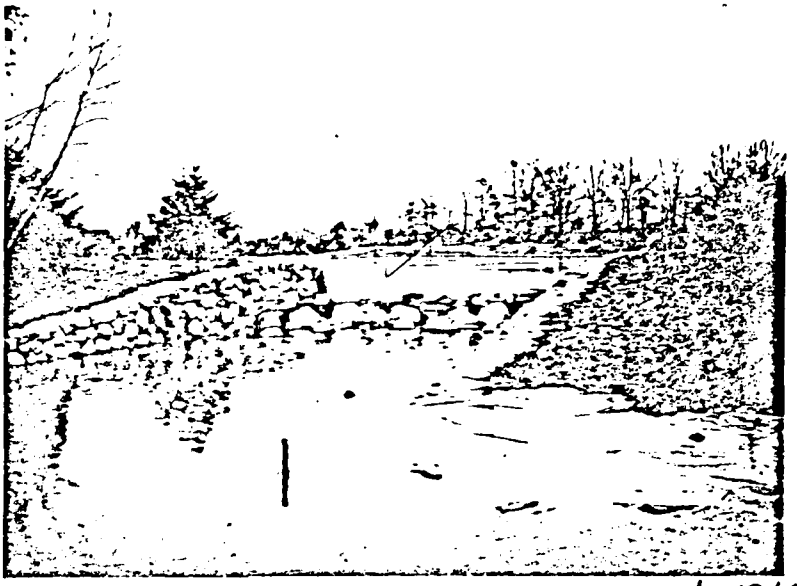
A

APPENDIX C
SELECTED PHOTOGRAPHS OF PROJECT

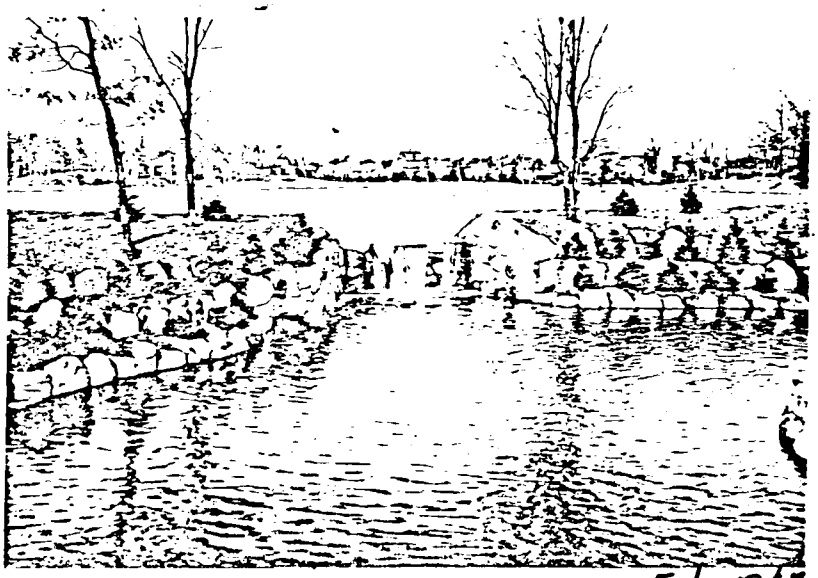
APPENDIX C

PHOTOGRAPHS

DAM NO 137.



Feb 1942



Feb 1942

B-5

From Commonwealth of Massachusetts DEQE Files

DAM NO. 137

COUNTY OF PLYMOUTH, MASSACHUSETTS
ENGINEERING DEPARTMENT
INSPECTION OF DAM AND RESERVOIRS

Inspector Groerer Date Feb. 1942. City or Town Brockton.

Location Southerly end of Lower Forter's Pond on Field Parkway (Salisbury Br

Owner City of Brockton Use

Material and Type Gravel & Clay Dyke - Stone Spillway

Maximum Head in Feet (Full Pond Level to Bottom of Spillway) 9 feet

Length 200 feet Width 40 feet plus

Area of Watershed 7 Sq. Miles Capacity 12,000,000 36.8 A.F. Gallons

Length of Overflow or Spillway 20 feet and 12 feet Outlets (Pipes or Flumes)

30 inch diam. pipe.

Dam Constructed by Under Construction by City - W.P.A. Date Aug. 1940

Recent Repairs Date

Evidence of Leakage None.

Condition New and sound.

Topography of Country Below Slightly irregular - Salisbury Brook - Ponds - City - Mea

Nature, extent, proximity, etc. of buildings, roads or other property in danger if failure should occur

No buildings near. Would be absorbed in 30 Acre Pond.

Remarks and Recommendations Spillways ample for all conditions except serious failure of dams above.

Sound & good condition May, 1944. No change Sept. 1946. Good-unchanged Nov. 1948. Good-no changes Nov. 1950. Sound May 1-1. No change - good July 1952. Sound-much water Feb. 1953. Good-plenty water Dec. 1954. Good as always. Sept. 1956. Good Oct. 1958. Good condition Sept. 1958. Good-no change Oct. 1960. Sound Oct. 1962. Good-no change Oct. 1964. Good-no change Dec. 1966. Good-no change Oct. 1968. Good-no change Oct. 1969.

B-4

From Commonwealth of Massachusetts DEQE Files

2

DESCRIPTION OF DAM

DISTRICT 7

Submitted by A. DUGAN Dam No. 7-12-44-7

Date 12-5-72 City/~~Town~~ BROCKTON

Name of Dam LOWER PORTER POND.

1. Location: Topo Sheet No. 32 D

Provide 8½" x 11" in clear copy of topo map with location of Dam clearly indicated.

2. Year Built UNKNOWN Year/s of Subsequent Repairs

3. Purpose of Dam: Water Supply Recreational X

Irrigation Other

4. Drainage Area: 7 Sq.Mi. Acres

5. Normal Ponding Area: Acres Ave.Depth

Impoundment: 12,000,000 Gals. Acre Ft.

6. No. and Type of Dwellings Located Adjacent to Pond or Reservoir

i.e. Summer Homes, etc. NONE

7. Dimensions of Dam: Length 200' Max. Height 9'

Slopes: Upstream Face 5'

Downstream Face 25'

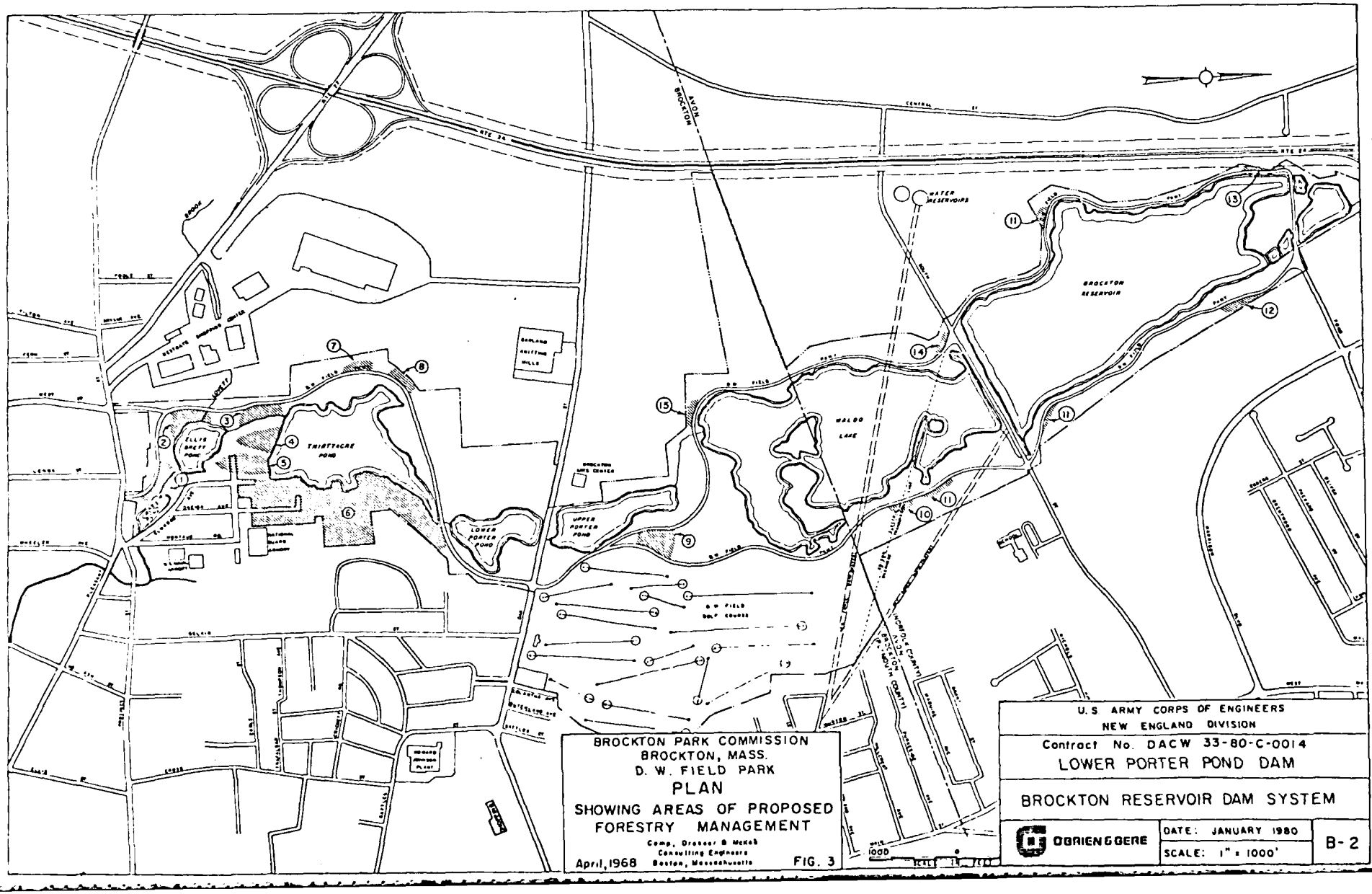
Width Across Top 40'

8. Classification of Dam by Material:

Earth X Conc. Masonry Stone Mason.

Timber Rockfill Other

From Commonwealth of Massachusetts DEQE Files B-3


BROCKTON PARK COMMISSION
BROCKTON, MASS.
D. W. FIELD PARK
PLAN
SHOWING AREAS OF PROPOSED
FORESTRY MANAGEMENT
Camp, Dresser & McKee
Consulting Engineers
April, 1968 Boston, Massachusetts
FIG. 3
U.S ARMY CORPS OF ENGINEERS
NEW ENGLAND DIVISION
Contract No. DACW 33-80-C-0014
LOWER PORTER POND DAM
BROCKTON RESERVOIR DAM SYSTEM
O'BRIEN & GERE
DATE: JANUARY 1980
SCALE: 1" = 1000'
B-2

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

O'BRIEN & GERE
ENGINEERS, INC.

SUBJECT	SHEET	BY	DATE	JOB NO
LOWER PORTER POND DAM				

APPENDIX D

HYDROLOGIC & HYDRAULIC COMPUTATIONS

TABLE OF CONTENTS

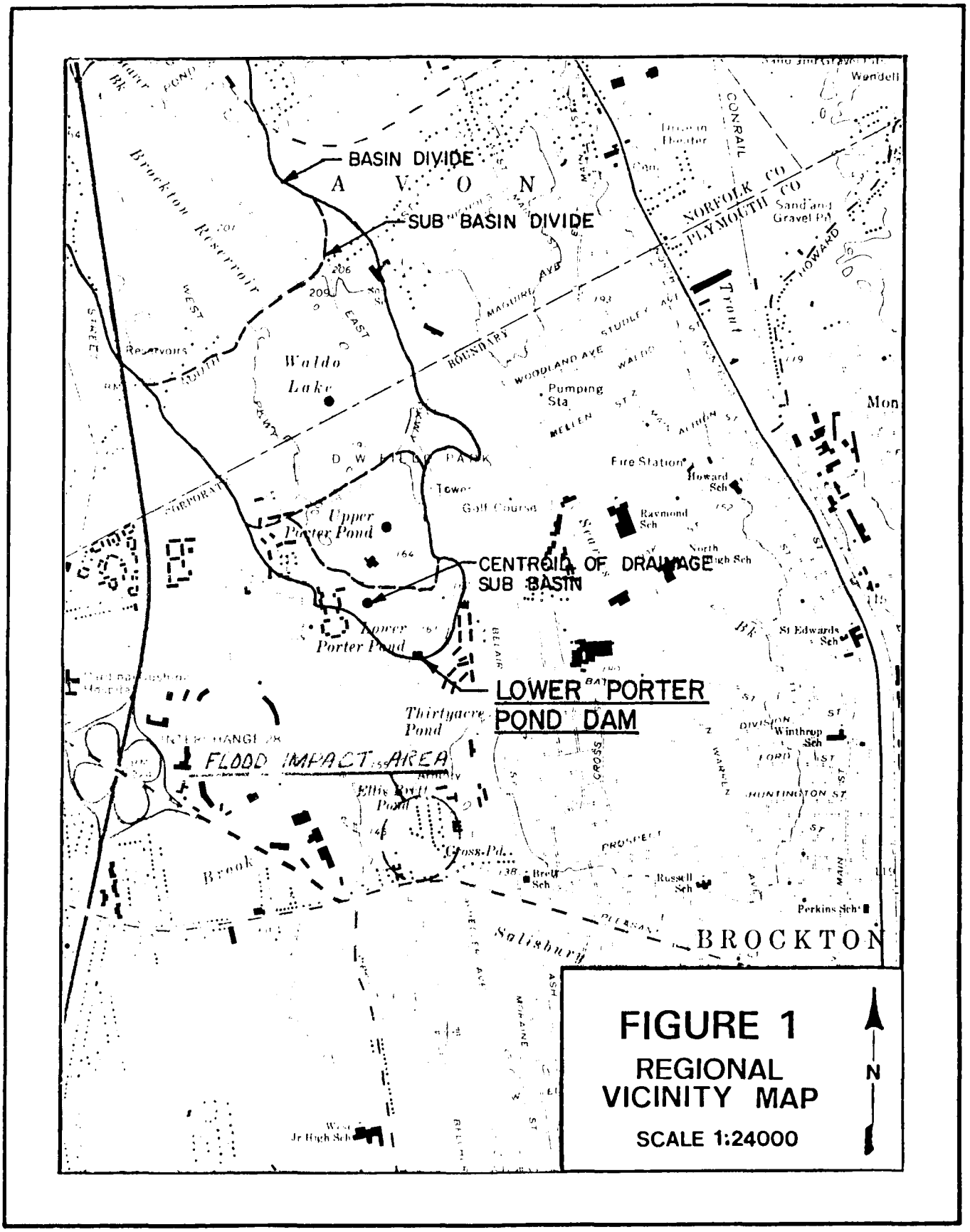


FIGURE 1

REGIONAL VICINITY MAP

SCALE 1:24000

BRYANT ASSOCIATES, INC.
648 Beacon Street
BOSTON, MASSACHUSETTS 02215
(617) 247-1800

JOB NED-COE, LOWER PORTER POND DAM
SHEET NO D-2 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

LOWER PORTER DAM - H & H

1/

SUBDRAINAGE AREA = 0.08 Sq.Mi

SNYDER HYDROGRAPH COEFFICIENTS

$C_t = 2.0$ $C_p = 0.5$

T_p COMPUTATIONS

$L = 0.64$ MILES $L_{ca} = 0.23$ MILES

$T_p = C_t \cdot (L \times L_{ca})^{.3}$

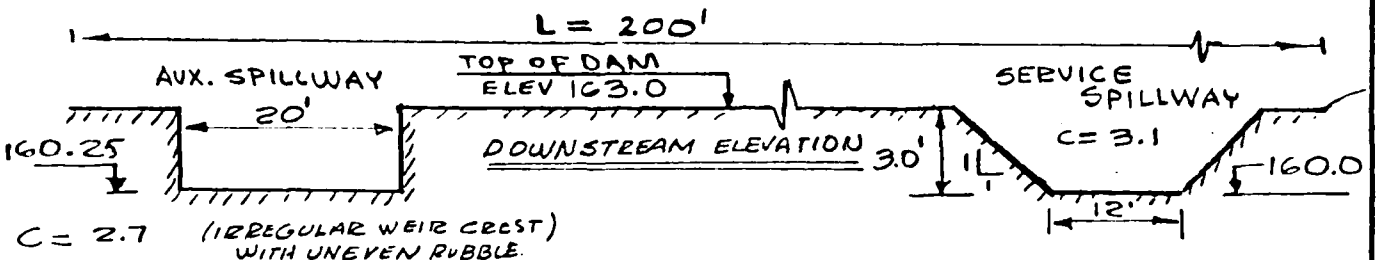
$T_p = 2 \times (.64 \times .23)^{.3} \simeq$ 1.13 HOURS

PMP DATA

FROM HMS #33 THE 24 HOUR 200 SqMi INDEX RAINFALL IS 21.5

6hr. % OF INDEX FOR THIS BASIN = 111
12hr. % " " " " " = 124
24hr. % " " " " " = 133

DAM ELEVATION & LENGTH and SPILLWAY DIMENSIONS SKETCH



C = 2.9 TOP OF DAM

LOOKING DOWNSTREAM

D-2

BRYANT ASSOCIATES, INC.
648 Beacon Street
BOSTON, MASSACHUSETTS 02215
(617) 247-1800

JOB NED-COE, LOWER PORTER POND DAM
SHEET NO D-3 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

LOWER PORTER DAM cont'd

STAGE DISCHARGE

H = 0 @ SERVICE SPILLWAY CREST (ELEV. 160.0 MSL)

1) SERVICE SPILLWAY : $C = 3.1$ $L = 12'$ $Z = 1$
$b_o = 12'$ FOR $H \leq 3$ $Q_1 = C\left(\frac{b_o + b_H}{2}\right) H^{1.5}$
FOR $H > 3$ $Q_1 = C\left[\left(\frac{b_o + b_H}{2}\right) 3^{1.5} + 18 \times (H-3)^{1.5}\right]$

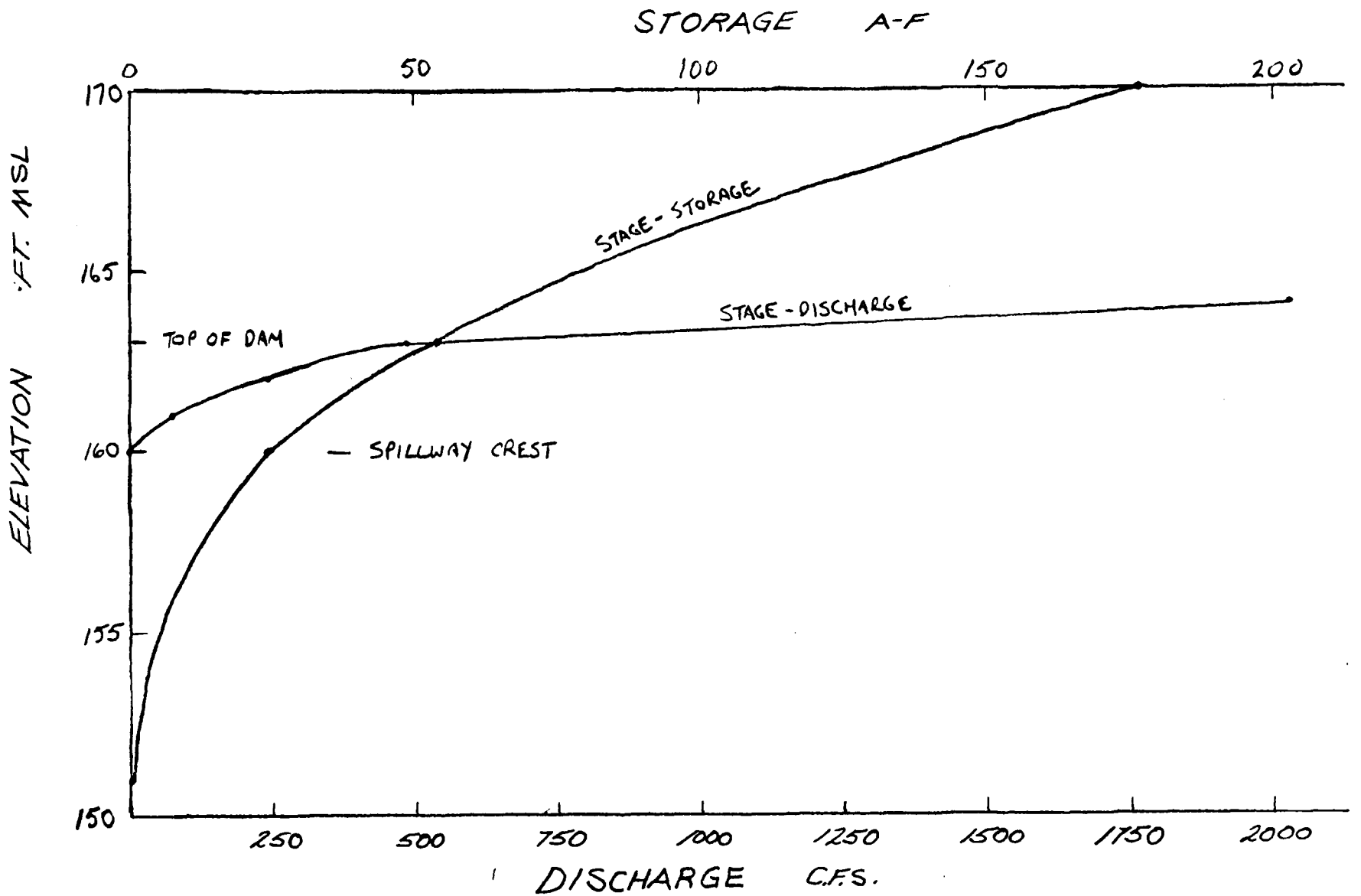
2) AUXILIARY SPILLWAY : $C = 2.7$ $L = 20'$ $Q_2 = C\,L\,(H - 0.25)^{1.5}$

3) TOP OF DAM : $C = 2.9$ $L = 200 - 38 = 162'$ $Q_3 = C\,L\,(H-3)^{1.5}$

ELEVATION MSL	H Ft	Q_1 CFS	Q_2 CFS	Q_3 CFS	ΣQ CFS
160	0	0	0	0	0
161	1	40	35	0	75
162	2	123	125	0	248
163	3	242	246	0	488
164	4	297	392	1,339	2,028
165	5	399	559	3,790	4,748
166	6	532	745	6,962	8,239
167	7	688	947	10,718	12,353
168	8	865	1,165	14,979	17,009

STORAGE

	ELEVATION (Ft.)	AREA (ac.) (PLANIMETERED FROM USGS)	STORAGE (Ac. FEET) (COMP. BY HEC-1 PROGRAM)
	151	0	0
NORMAL POOL	160	8	24
TOP OF DAM	163	—	54
	170	24	177



LOWER PORTER POND DAM

STAGE VS. STORAGE
STAGE VS. DISCHARGE

APPENDIX D

BRYANT ASSOCIATES, INC.
648 Beacon Street
BOSTON, MASSACHUSETTS 02215
(617) 247-1800

JOB NED-COE, LOWER PORTER POND DAM
SHEET NO D-5 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

BROCKTON LAKE DAM - H & H

1/

DRAINAGE AREA = 2.8 Sq.Mi

SNYDER HYDROGRAPH COEFFICIENTS

$C_t = 2.0$ $C_p = 0.5$

T_p COMPUTATIONS

$L = 2.70$ MILES $L_{ca} = 1.40$ MILES

$T_p = C_t \cdot (L \times L_{ca})^{.3}$

$T_p = 2.0 \times (2.7 \times 1.4)^{.3} = \underline{3.0}$ HOURS

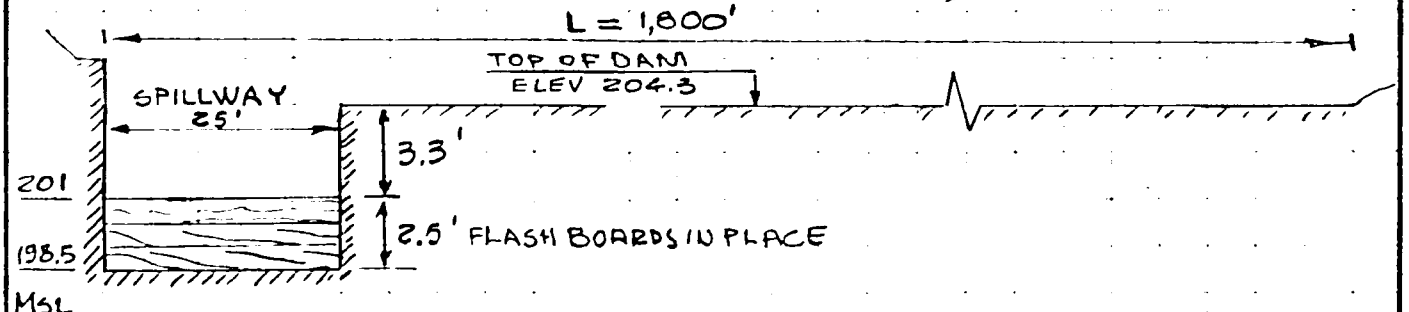
PMP DATA

FROM HMS #33 THE 24 HOUR 200 SqMi INDEX RAINFALL IS 21.5

6hr. % OF INDEX FOR THIS BASIN = 111
12hr. % " " " " " = 124
24hr. % " " " " " = 133

DAM ELEVATION & LENGTH and SPILLWAY DIMENSIONS SKETCH

LOOKING DOWNSTREAM



LOOKING DOWNSTREAM

C = 3.3 W/BOARDS
C = 2.9 W/out

C = 2.9 TOP OF DAM

D-5

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JOB NED-COE, LOWER PORTER POND DAM
SHEET NO D- 6 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

BROCKTON LAKE DAM - H&H cont'd

STAGE DISCHARGE WITH FLASHBOARDS

(H=0 @ SPILLWAY CREST)

1) SPILLWAY : $C = 3.3$ $L = 25'$ $Q_s = CLH^{1.5}$

2) TOP OF DAM : $C = 2.9$ $L = 1800-25 = 1775$ $Q_{dam} = CL(H-3.3)^{1.5}$

ELEVATION MSL	H Ft.	Q_s CFS	Q_{top} CFS	EQ CFS
201	0	0	0	0
202	1	83	0	83
203	2	233	0	233
204	3	429	0	429
204.3	3.3	495	0	495
205	4	660	3,015	3,675
206	5	922	11,410	12,332
207	6	1,213	22,837	24,050
208	7	1,528	36,635	38,163
209	8	1,867	52,450	54,317
210	9	2,228	70,050	72,278

SPILLWAY DISCHARGE WITH NO FLASHBOARDS FOR TOP OF DAM EL.

$C = 2.8$ $L = 25$ $q = CL(H+2.5)^{1.5}$

$q = 978$ CFS

STORAGE

	ELEV. (MSL)	AREA (Ac.) (PLANIMETERED FROM USGS)	STORAGE (ACRE FEET) (COMPUTED BY HEC-1 PROGRAM)
	194.3	0	0
NORMAL POOL	201	85	190
TOP OF DAM	204.3	—	493
	210	126	1133

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JOB NED-COE, LOWER PORTER POND DAM
SHEET NO D-7 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

WALDO LAKE DAM - H&H

1/

SUBDRAINAGE AREA = 0.38 Sq Mi

SNYDER HYDROGRAPH COEFFICIENTS

$C_t = 2.0$ $C_p = 0.5$

Tp COMPUTATIONS

$L = 0.85$ MILES $L_{ca} = 0.28$

$T_p = C_t \cdot (L \times L_{ca})^{.3}$

$T_p = 2 \times (.85 \times .28)^{.3}$ $T_p \simeq$ 1.25 HOURS

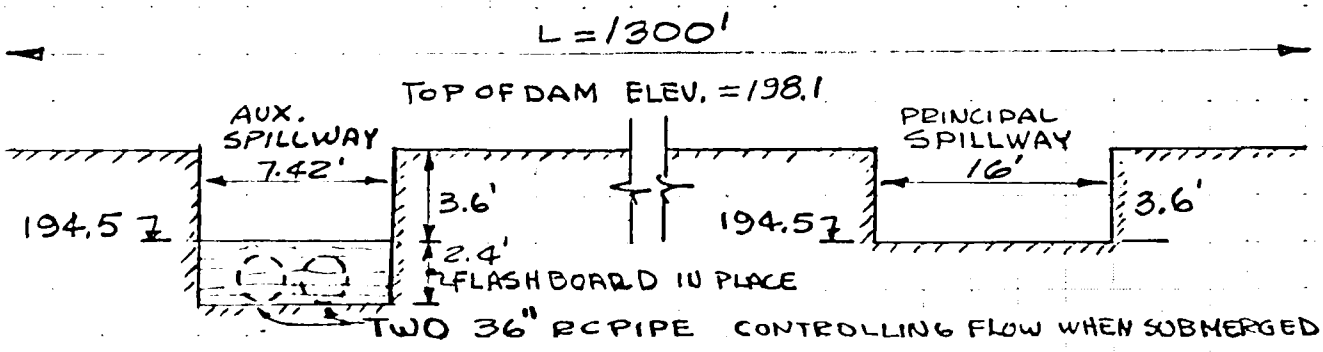
PMP DATA

FROM HMS #33 THE 24 HOUR 200 Sq Mi INDEX RAINFALL IS 21.5

6hr.	%	OF	INDEX	FOR	THIS	BASIN	= 111
12hr	"	"	"	"	"	"	= 124
24hr	"	"	"	"	"	"	= 133

DAM ELEVATION & LENGTH and SPILLWAYS DIMENSIONS SKETCH

LOOKING DOWNSTREAM



$C = 3.3$ W/BOARDS $C_{Top} = 2.9$ $C = 3.1$

LOOKING DOWNSTREAM

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JOB NED-COE, LOWER PORTER POND DAM
SHEET NO D- 8 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

WALDO LAKE DAM H&H cont'd

STAGE DISCHARGE

H=0 @ SPILLWAY CREST

1) SERVICE SPILLWAY : C = 3.1 L = 16' $Q_1 = CLH^{1.5}$
2) AUXILIARY SPILLWAY : C = 3.3 L = 7.42' $Q_2 = CLH^{1.5}$ FOR $H \leq 3.6$
3) H > 3.6 PIPE CONTROL $Q_3 = .65A\sqrt{2gd}$*
4) TOP OF DAM : C = 2.9 L = 300' $Q_4 = CL(H-3.6)^{1.5}$

d = depth of water to centroid of pipe

ELEVATION MSL	H FT	Q_1	Q_2	Q_3	Q_4	ΣQ
		CFS				
194.5	0	0	0		0	
195.5	1	50	25		0	75
196.5	2	140	69.	PIPE FLOW	0	209
197.5	3	258	127.		0	418
198.1	3.6	333	160		0	499
198.5	4	397	6	173	936	1,500
199.5	5	555	41.	188	6,132	6,916
200.5	6	729	91	202	13,764	14,786
201.5	7	919	154	215	23,209	24,497
202.5	8	1,122	226	227	34,168	35,743

OVERTOPPING

SURCHARGE STORAGE

PLANIMETERED FROM USGS
COMPUTED BY HEC-1 PROGRAM

		ELEVATION (MSL)	AREA (AC)	STORAGE (AC. FEET)
NORMAL POOL	(FROM)	194.5	77.	0
TOP OF DAM	(TO)	198.1	–	342
		200	137	581

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JOB NED-COE, LOWER PORTER POND DAM
SHEET NO D-9 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

UPPER PORTER DAM - H & H

1/

SUBDRAINAGE AREA = 0.11 Sq. Mi

SNYDER HYDROGRAPH COEFFICIENTS

$C_t = 2.0$ $C_p = 0.5$

T_p COMPUTATIONS

$L = 0.44$ MILES $L_{ca} = 0.22$ MILES

$T_p = C_t \cdot (L \times L_{ca})^{.3}$

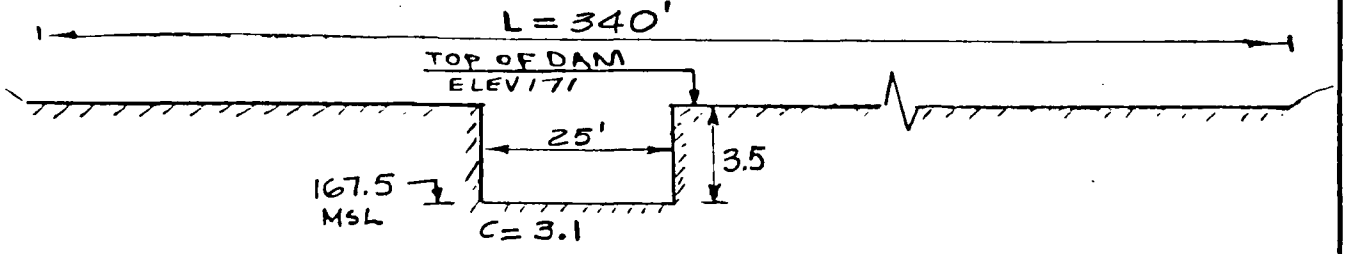
$T_p = 2 \times (.44 \times .22)^{.3} \simeq$ 1.0 HOUR

PMP DATA

FROM HMS #33 THE 24 HOUR 200 SqMi INDEX RAINFALL IS 21.5

6hr. % OF INDEX FOR THIS BASIN = 111
12hr. % " " " " " = 124
24hr. % " " " " " = 133

DAM ELEVATION & LENGTH and SPILLWAY DIMENSIONS SKETCH



C = 2.8 TOP OF DAM

LOOKING DOWNSTREAM

D-9

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JOB NED-COE
SHEET NO D- 10 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

UPPER PORTER DAM - H&H

STAGE DISCHARGE

(H=0 @ SPILLWAY CREST) ELEVATION = 167.5 MSL

1) SPILLWAY: $C = 3.1$ $L = 25'$ $Q_S = CLH^{1.5}$

2) TOP OF DAM: $C = 2.9$ $L = 340 - 25 = 315$ $Q_{TOP} = CL(H-3.5)^{1.5}$

ELEVATION MSL	H Ft.	Q_S CFS	Q_{TOP} CFS	ΣQ CFS
167.5	0	0	0	
168.5	1	78	0	78
169.5	2	219	0	219
170.5	3	403	0	403
171.0	3.5	508	0	508
172.0	4.5	740	913	1,653
173.0	5.5	1,000	2,584	3,584
174.0	6.5	1,284	4,747	6,031
175.0	7.5	1,592	7,308	8,900
176.0	8.5	1,921	10,213	12,134

STORAGE

	ELEV. (MSL)	AREA (AC) (PLANIMETERED FROM USGS)	STORAGE (AC. FEET) (COMP. BY HEC-1 PROGRAM)
	160	0	0
NORMAL POOL	167.5	11	28
TOP OF DAM	171	19	79

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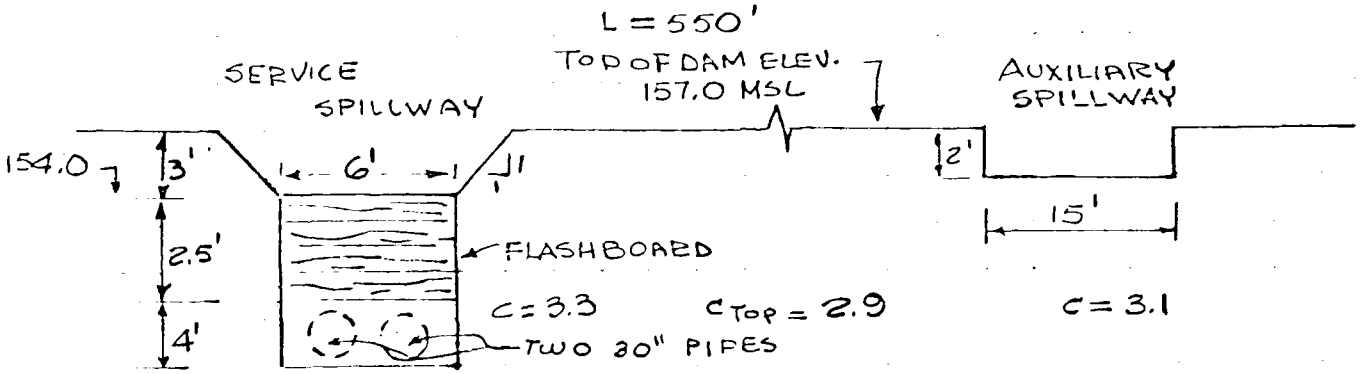
JOB NED-COE, LOWER PORTER POND DAM
SHEET NO D-11 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

THIRTY ACRE POND

DAM ELEVATION & LENGTH and SPILLWAYS DIMENSIONS SKETCH



STAGE DISCHARGE

H = 0 @ SERVICE SPILLWAY CREST (ELEV. = 154.0 MSL)

1) SERVICE SPILLWAY FOR $H \leq 3$ $Q_1 = C\left(\frac{b_0 + b_H}{2}\right)H^{1.5}$

FOR $H > 3$ $Q_1 = C\left[\left(\frac{b_0 + b_H}{2}\right)3^{1.5} + 12 \times (H-3)^{1.5}\right]$

2) AUXILIARY SPILLWAY $Q_3 = C\,L\,(H-1)^{1.5}$

3) TOP OF DAM: L = 523' $Q_4 = C\,L\,(H-3)^{1.5}$

ELEVATION MSL	H Ft.	Q_1	Q_2	Q_3	Q_4	EQ CFS
154	0	0		0	0	
155	1	23		0	0	23
156	2	75	PIPE FLOW	47	0	122
157	3	11	143	131	0	285
158	4	40	152	242	1517	1951
159	5	112	160	312	4290	4934
160	6	206	168	520	7881	8775

OVER TOPPING

SURCHARGE STORAGE

	ELEVATION	AREA (AC.) (PLANIMETERED FROM USGS)	STORAGE (AC FT.) (COMPUTED BY HEC-1 PROGRAM)
NORMAL POOL	154	26	0
TOP OF DAM	157	—	86
	160	37	188

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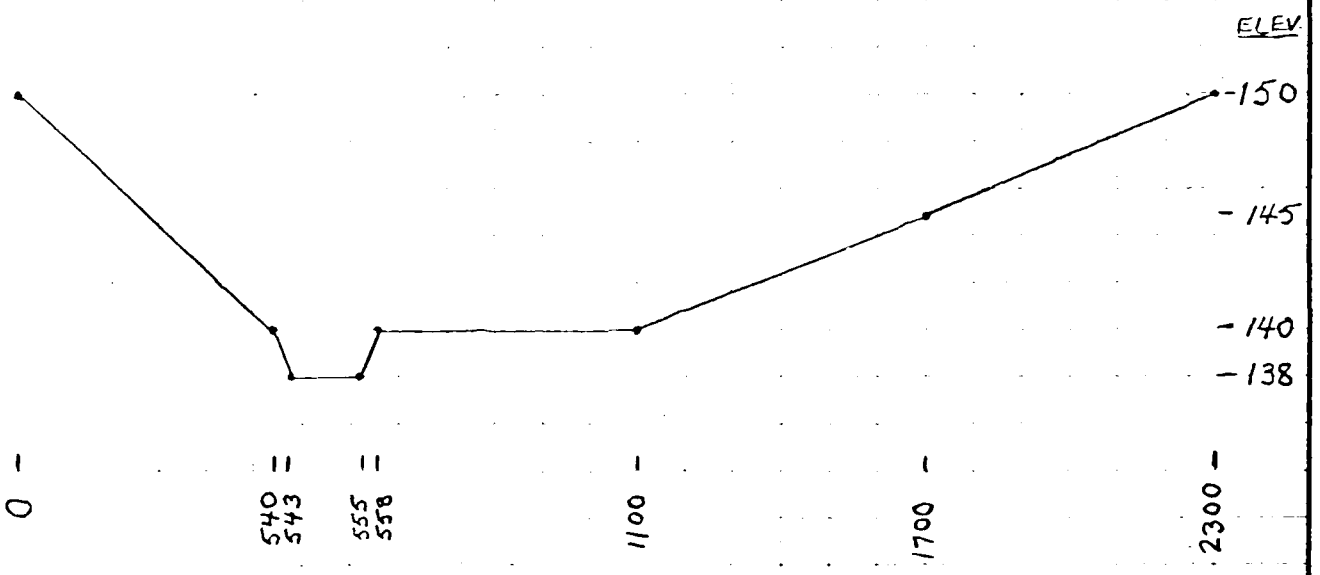
JOB NED-COE, LOWER PORTER POND DAM
SHEET NO D-12 OF
CALCULATED BY RG DATE
CHECKED BY SHS DATE
SCALE

BROCKTON

DOWNSTREAM ROUTING

SECTION @ HAZARD AREA

1200 FEET DOWNSTREAM OF THIRTYACRE POND DAM



MANNING'S COEFFICIENTS : CHANNEL → 0.03
OVERBANKS → 0.08

CHANNEL SLOPE : .008 FT./FT.

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******************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION        JULY 1978
 LAST MODIFICATION  26 FEB 79
******************************
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LOWER FORTER POND DAM BREACH OUTFLOW
ROUTED THROUGH THIRTYACRE POND TO THE DAMAGE AREA

INPUT

```
A              HYDROLOGIC ANALYSIS OF LOWER PORTER POND
A                  NATIONAL DAM SAFETY PROGRAM
A              NEW ENGLAND DIVISION - CORPS OF ENGINEERS
B     300      0     10      0      0      0      0      0     -4      0
B1      5
J       1      1      1
J1      0
K       1  LPORT                                     1
K1        ROUTED OUTFLOW FROM LOWER PORTER POND
Y                            1      1
Y1      1                                     -163     -1
Y4    160    161    162    163    164    165    166    167    168
Y5      0     75    248    489   2028   4748   8239  12353  17009
$A      0      8     24
$E    151    160    170
$$    160
$D    163
$B     20   0.01    156      1  163.0  163.0
K       1  TPOND                                     1
K1        LOWER PORTER POND BREACH THROUGH THIRTYACRE POND
Y                            1      1
Y1      1                                     -154     -1
Y4    154    155    156    157    158    159    160
Y5      0     23    122    285   1951   4934   8775
$A     26     37
$E    154    160
$$    154
$D    157
K       1  HAZARD                                    1
K1        CHANNEL ROUTING TO HAZARD CENTER
Y                            1      1
Y1      1                                       -1
Y6   0.35   0.03   0.08    138    150   1200  0.008
Y7      0    150    540    140    543    138    555    138    558    140
Y7   1100    140   1700    145   2300    150
K      99
```

FLOOD RESULTS AT LOWER PORTER POND DAM

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	160.00	160.00	163.00
STORAGE	24.	24.	54.
OUTFLOW	0.	0.	488. → SPILLWAY DISCHARGE CAPACITY

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	161.38	0.00	36.	140.	0.00	31.67	0.00
.20	162.41	0.00	47.	346.	0.00	29.50	0.00
.30	163.20	.20	56.	799.	7.17	22.83	0.00
.40	163.76	.76	63.	1663.	10.67	20.83	0.00
.50	164.18	1.18	69.	2506.	12.67	19.83	0.00
.60	164.43	1.43	72.	3195.	14.00	19.33	0.00
.70	164.65	1.65	75.	3809.	15.17	19.17	0.00
.80	164.87	1.87	78.	4381.	16.00	19.00	0.00
1.00	165.23	2.23	84.	5558.	17.33	18.83	0.00

→ TEST FLOOD ELEVATION

→ TEST FLOOD ROUTED OUTFLOW

FLOOD RESULTS AT BROCKTON RESERVOIR DAM

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	201.00	201.00	204.30
STORAGE	190.	190.	493.
OUTFLOW	0.	0.	495.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	202.83	0.00	353.	208.	0.00	23.00	0.00
.20	204.22	0.00	485.	478.	0.00	22.33	0.00
.30	204.47	.17	511.	1285.	5.50	19.67	0.00
.40	204.59	.29	523.	1826.	7.67	19.00	0.00
.50	204.70	.40	533.	2302.	9.33	18.83	0.00
.60	204.80	.50	543.	2765.	10.33	18.83	0.00
.70	204.90	.60	554.	3226.	11.33	18.83	0.00
.80	205.00	.70	564.	3694.	12.17	18.83	0.00
1.00	205.11	.81	575.	4639.	13.50	18.67	0.00

FLOOD RESULTS AT WALDO LAKE DAM

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	194.50	194.50	198.10
STORAGE	0.	0.	342.
OUTFLOW	0.	0.	499.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	195.00	0.00	126.	142.	0.00	29.67	0.00
.20	197.18	0.00	242.	351.	0.00	27.67	0.00
.30	198.22	.12	356.	804.	4.33	22.33	0.00
.40	198.53	.43	393.	1674.	7.50	20.50	0.00
.50	198.67	.57	410.	2445.	9.50	19.50	0.00
.60	198.79	.69	424.	3081.	10.67	19.17	0.00
.70	198.90	.80	437.	3644.	11.83	19.00	0.00
.80	198.99	.89	449.	4179.	12.67	19.00	0.00
1.00	199.20	1.10	475.	5285.	14.00	18.83	0.00

FLOOD RESULTS AT UPPER PORTER POND DAM

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	167.50	167.50	171.00
STORAGE	28.	28.	79.
OUTFLOW	0.	0.	508.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	168.94	0.00	46.	141.	0.00	30.83	0.00
.20	170.20	0.00	65.	347.	0.00	28.83	0.00
.30	171.25	.25	84.	794.	3.83	22.67	0.00
.40	172.00	1.00	100.	1653.	7.33	20.67	0.00
.50	172.43	1.43	109.	2476.	9.17	19.67	0.00
.60	172.77	1.77	117.	3144.	10.50	19.33	0.00
.70	173.06	2.06	124.	3738.	11.67	19.00	0.00
.80	173.29	2.29	130.	4237.	12.50	19.00	0.00
1.00	173.70	2.70	142.	5441.	14.00	18.83	0.00

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .10	RATIO 2 .20	RATIO 3 .30	RATIO 4 .40	RATIO 5 .50	RATIO 6 .60	RATIO 7 .70	RATIO 8 .80	RATIO 9 1.00	
HYDROGRAPH AT	BROCK	2.80	1	465.	931.	1396.	1862.	2327.	2792.	3258.	3723.	4654.	BROCKTON INFLOW
		(7.25)		(13.18)	(26.36)	(39.54)	(52.71)	(65.89)	(79.07)	(92.25)	(105.43)	(131.79)	
ROUTED TO	DAM 0	2.80	1	208.	478.	1285.	1826.	2302.	2765.	3226.	3694.	4639.	BROCKTON OUTFLOW
		(7.25)		(5.89)	(13.53)	(36.38)	(51.70)	(65.18)	(78.31)	(91.36)	(104.61)	(131.37)	
HYDROGRAPH AT	WALDO	.38	1	102.	204.	307.	409.	511.	613.	715.	817.	1022.	WALDO LOCAL RUNOFF
		(.98)		(2.89)	(5.78)	(8.68)	(11.57)	(14.47)	(17.36)	(20.25)	(23.15)	(28.93)	
2 COMBINED	TAL	3.18	1	217.	502.	1418.	2073.	2631.	3164.	3691.	4218.	5334.	WALDO TOTAL INFLOW
		(8.24)		(6.14)	(14.21)	(40.14)	(58.69)	(74.51)	(89.59)	(104.53)	(119.44)	(151.03)	
ROUTED TO	WALDO	3.18	1	142.	351.	804.	1674.	2445.	3081.	3644.	4179.	5285.	WALDO OUTFLOW
		(8.24)		(4.01)	(9.93)	(22.77)	(47.39)	(69.24)	(87.24)	(103.18)	(118.32)	(149.66)	
HYDROGRAPH AT	UPORT	.11	1	33.	67.	100.	133.	166.	200.	233.	266.	333.	UPPER PORTER LOCAL RUNOFF
		(.28)		(.93)	(1.89)	(2.83)	(3.77)	(4.71)	(5.66)	(6.60)	(7.54)	(9.43)	
2 COMBINED	TOTAL	3.29	1	142.	351.	811.	1695.	2497.	3160.	3748.	4304.	5451.	UPPER PORTER TOTAL INFLOW
		(8.52)		(4.02)	(9.94)	(22.95)	(47.99)	(70.72)	(89.49)	(106.12)	(121.87)	(154.35)	
ROUTED TO	UPONT	3.29	1	141.	347.	798.	1653.	2476.	3144.	3738.	4297.	5441.	UPPER PORTER OUTFLOW
		(8.52)		(3.98)	(9.83)	(22.59)	(46.82)	(70.10)	(89.02)	(105.86)	(121.66)	(154.07)	
HYDROGRAPH AT	LPONT	.08	1	24.	48.	73.	97.	121.	145.	170.	194.	242.	LOWER PORTER LOCAL RUNOFF
		(.21)		(.69)	(1.37)	(2.06)	(2.74)	(3.43)	(4.11)	(4.80)	(5.49)	(6.86)	
2 COMBINED	TOTAL	3.37	1	141.	347.	802.	1667.	2510.	3195.	3814.	4383.	5561.	LOWER PORTER TOTAL INFLOW
		(8.73)		(3.98)	(9.84)	(22.70)	(47.21)	(71.06)	(90.47)	(108.00)	(124.11)	(157.48)	
ROUTED TO	LPORT	3.37	1	140.	346.	799.	1663.	2506.	3195.	3809.	4381.	5558.	LOWER PORTER OUTFLOW
		(8.73)		(3.97)	(9.81)	(22.63)	(47.08)	(70.96)	(90.48)	(107.86)	(124.07)	(157.38)	

TEST FLOOD PEAK INFLOW

ROUTED TEST FLOOD OUTFLOW

HYDROGRAPH ROUTING

ROUTED OUTFLOW FROM LOWER PORTER POND

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	LPORT	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP		LSTR
0.0	0.000	0.00	1	1	0	0		0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-160.	-1

STAGE	160.00	161.00	162.00	163.00	164.00	165.00	166.00	167.00	168.00
FLOW	0.00	75.00	248.00	488.00	2024.00	4748.00	8239.00	12353.00	17009.00

STAGE-DISCHARGE DATA FOR LOWER PORTER POND DAM

SURFACE AREA=	0.	8.	24.
CAPACITY=	0.	24.	177.
ELEVATION=	151.	160.	170.

STAGE-STORAGE DATA FOR LOWER PORTER POND DAM

SPILLWAY CREST ELEVATION →

CREL	SPWID	COQW	EXPW	ELEVL	COOL	CAREA	EXPL
160.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOP OF DAM ELEVATION →

TOPEL	COQD	EXPD	DAMWID
163.0	0.0	0.0	0.

.1 PMF
PEAK OUTFLOW IS 140. AT TIME 31.67 HOURS

.2 PMF
PEAK OUTFLOW IS 345. AT TIME 29.50 HOURS

.3 PMF
PEAK OUTFLOW IS 799. AT TIME 22.83 HOURS

.4 PMF
PEAK OUTFLOW IS 1663. AT TIME 20.83 HOURS

.5 PMF
PEAK OUTFLOW IS 2506. AT TIME 19.83 HOURS

.6 PMF
PEAK OUTFLOW IS 3195. AT TIME 19.33 HOURS

.7 PMF
PEAK OUTFLOW IS 3809. AT TIME 19.17 HOURS

.8 PMF
PEAK OUTFLOW IS 4381. AT TIME 19.00 HOURS

PMF
PEAK OUTFLOW IS 5654. AT TIME 18.83 HOURS

ROUTED OUTFLOWS FROM LOWER PORTER POND DAM

TEST FLOOD

LOCAL RUNOFF TO LOWER PORTER POND

SUB-AREA RUNOFF COMPUTATION

INFLOW TO LOWER PORTER POND LESS UPPER PORTER POND

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	LPORT	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	.08	0.00	3.37	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	111.00	124.00	133.00	0.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 1.00 CP= .50 NTA= 0

RECESSION DATA

STRTQ= -1.70 QRCSN= -.10 RTIOR= 2.00

UNIT HYDROGRAPH 46 END-OF-PERIOD ORDINATES, LAG= 1.00 HOURS, CP= .50 VOL= 1.00

2.	6.	11.	18.	23.	26.	26.	23.	21.	18.
16.	14.	13.	11.	10.	9.	8.	7.	6.	5.
5.	4.	4.	3.	3.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	1.	1.	0.	0.
0.	0.	0.	0.	0.	0.				

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	22.88	21.68	1.20	6748.
										(581.)	(551.)	(30.)	(191.08)

COMBINING LOWER PORTER POND LOCAL RUNOFF AND UPPER PORTER POND ROUTED OUTFLOW

COMBINE HYDROGRAPHS

COMBINE HYDROGRAPHS

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	TOTAL	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

ROUTED OUTFLOW FROM UPPER PORTER POND

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
0	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP		LSTR
0.0	0.000	0.00	1	1	0	0		0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-168.	-1

STAGE	167.50	168.50	169.50	170.50	171.00	172.00	173.00	174.00	175.00	176.00
FLOW	0.00	78.00	219.00	403.00	508.00	1653.00	3584.00	6031.00	8900.00	12134.00

STAGE - DISCHARGE DATA FOR UPPER PORTER POND DAM

SURFACE AREA=	0.	11.	19.
CAPACITY=	0.	28.	79.
ELEVATION=	160.	168.	171.

STAGE-STORAGE DATA FOR UPPER PORTER POND DAM

	CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
SPILLWAY CREST ELEVATION →	167.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
TOP OF DAM ELEVATION → 171.0	0.0	0.0	0.

.1 PMF PEAK OUTFLOW IS	141. AT TIME	30.83 HOURS
.2 PMF PEAK OUTFLOW IS	347. AT TIME	28.83 HOURS
.3 PMF PEAK OUTFLOW IS	798. AT TIME	22.67 HOURS
.4 PMF PEAK OUTFLOW IS	1653. AT TIME	20.67 HOURS
.5 PMF PEAK OUTFLOW IS	2476. AT TIME	19.67 HOURS
.6 PMF PEAK OUTFLOW IS	3144. AT TIME	19.33 HOURS
.7 PMF PEAK OUTFLOW IS	3738. AT TIME	19.00 HOURS
.8 PMF PEAK OUTFLOW IS	4297. AT TIME	19.00 HOURS
PMF PEAK OUTFLOW IS	5441. AT TIME	18.83 HOURS

ROUTED OUTFLOWS FROM UPPER PORTER POND

LOCAL RUNOFF TO UPPER PORTER POND

SUB-AREA RUNOFF COMPUTATION

INFLOW TO UPPER PORTER POND LESS WALDO LAKE

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
UPORT		0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	.11	0.00	3.37	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	111.00	124.00	133.00	0.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 1.00 CP= .50 NTA= 0

RECESSION DATA

STRTQ= -1.70 QRCSN= -.10 RTIOR= 2.00

UNIT HYDROGRAPH 46 END-OF-PERIOD ORDINATES, LAG= 1.00 HOURS, CP= .50 VOL= 1.00

2.	8.	16.	24.	31.	35.	35.	32.	28.	25.
22.	20.	17.	15.	13.	12.	10.	9.	8.	7.
6.	6.	5.	4.	4.	3.	3.	3.	2.	2.
2.	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	0.	0.	0.	0.	0.				

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	22.88	21.68	1.20	9280.
										(581.)	(551.)	(30.)	(262.78)

COMBINE HYDROGRAPHS - COMBINING UPPER PORTER POND LOCAL RUNOFF AND WALDO LAKE ROUTED OUTFLOW

COMBINE HYDROGRAPHS

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
TOTAL		2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

ROUTED OUTFLOW FROM WALDO LAKE

	ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	WALDO	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-195.	-1

STAGE	194.50	195.50	196.50	197.50	198.10	198.50	199.50	200.50	201.50	202.50
FLOW	0.00	75.00	209.00	418.00	499.00	1500.00	6916.00	14786.00	24497.00	35743.00

} STAGE-DISCHARGE DATA FOR WALDO LAKE DAM

SURFACE AREA=	77.	137.
CAPACITY=	..	581.
ELEVATION=	195.	200.

} STAGE-STORAGE DATA FOR WALDO LAKE DAM

SPILLWAY CREST ELEVATION →

CREL	SPWID	COOW	EXPW	ELEVL	COOL	CAREA	EXPL
194.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOP OF DAM ELEVATION →

TOPEL	COOD	EXPD	DAMWID
198.1	0.0	0.0	0.

.1 PMF
PEAK OUTFLOW IS 142. AT TIME 29.67 HOURS

.2 PMF
PEAK OUTFLOW IS 351. AT TIME 27.67 HOURS

.3 PMF
PEAK OUTFLOW IS 804. AT TIME 22.33 HOURS

.4 PMF
PEAK OUTFLOW IS 1674. AT TIME 20.50 HOURS

.5 PMF
PEAK OUTFLOW IS 2445. AT TIME 19.50 HOURS

.6 PMF
PEAK OUTFLOW IS 3081. AT TIME 19.17 HOURS

.7 PMF
PEAK OUTFLOW IS 3644. AT TIME 19.00 HOURS

.8 PMF
PEAK OUTFLOW IS 4179. AT TIME 19.00 HOURS

PMF
PEAK OUTFLOW IS 5285. AT TIME 18.83 HOURS

} ROUTED OUTFLOWS FROM WALDO LAKE

LOCAL RUNOFF TO WALDO LAKE

SUB-AREA RUNOFF COMPUTATION

INFLOW TO WALDO LAKE LESS BROCKTON

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
WALDO	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	.38	0.00	3.37	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	111.00	124.00	133.00	0.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 1.25 CP= .50 NTA= 0

RECESSION DATA

STRTQ= -1.70 QRCSN= -.10 RTIOR= 2.00

UNIT HYDROGRAPH 59 END-OF-PERIOD ORDINATES, LAG= 1.26 HOURS, CP= .50 VOL= 1.00

4.	16.	32.	50.	69.	85.	95.	99.	95.	86.
78.	71.	64.	58.	53.	48.	43.	39.	36.	32.
29.	27.	24.	22.	20.	18.	16.	15.	13.	12.
11.	10.	9.	8.	7.	7.	6.	6.	5.	5.
4.	4.	3.	3.	3.	3.	2.	2.	2.	2.
2.	1.	1.	1.	1.	1.	1.	1.	1.	

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	22.HR	21.68	1.20	31985.
										(581.)	(551.)	(30.)	(905.71)

0-17

COMBINE HYDROGRAPHS - COMBINING WALDO LAKE LOCAL RUNOFF AND BROCKTON RESERVOIR ROUTED OUTFLOW

COMBINE HYDROGRAPHS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
TAL	2	0	0	0	0	1	0	0

HYDROGRAPH ROUTING

ROUTED OUTFLOW FROM BROCKTON LAKE DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
DAM 0	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-201.	-1

STAGE-DISCHARGE DATA FOR BROCKTON RESERVOIR DAM

STAGE	201.00	202.00	203.00	204.00	204.30	205.00	206.00	207.00	208.00	209.00
	210.00									
FLOW	0.00	83.00	233.00	429.00	495.00	3675.00	12332.00	24050.00	38163.00	54317.00
	70278.00									

STAGE-STORAGE DATA FOR BROCKTON RESERVOIR DAM

SURFACE AREA=	0.	85.	126.
CAPACITY=	0.	190.	1133.
ELEVATION=	194.	201.	210.

SPILLWAY CREST ELEVATION → 201.0

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
201.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOP OF DAM ELEVATION → 204.3

TOPEL	COQD	EXPD	DAMWID
204.3	0.0	0.0	0.

ROUTED OUTFLOWS FROM BROCKTON RESERVOIR

.1 PMF
PEAK OUTFLOW IS 208. AT TIME 23.00 HOURS

.2 PMF
PEAK OUTFLOW IS 478. AT TIME 22.33 HOURS

.3 PMF
PEAK OUTFLOW IS 1285. AT TIME 19.67 HOURS

.4 PMF
PEAK OUTFLOW IS 1826. AT TIME 19.00 HOURS

.5 PMF
PEAK OUTFLOW IS 2302. AT TIME 18.83 HOURS

.6 PMF
PEAK OUTFLOW IS 2765. AT TIME 18.83 HOURS

.7 PMF
PEAK OUTFLOW IS 3226. AT TIME 18.83 HOURS

.8 PMF
PEAK OUTFLOW IS 3696. AT TIME 18.83 HOURS

PMF
PEAK OUTFLOW IS 4439. AT TIME 18.67 HOURS

DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

RUN DATE= 02/11/80.
TIME= 14.46.16.

HYDROLOGIC ANALYSIS OF LOWER PORTER POND
NATIONAL DAM SAFETY PROGRAM
NEW ENGLAND DIVISION - CORPS OF ENGINEERS

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
300	0	10	0	0	0	0	0	-4	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 9 LRTIO= 1

PERCENTAGES OF PMF USED → RTIOS= .10 .20 .30 .40 .50 .60 .70 .80 1.00

INFLOW HYDROGRAPH DEVELOPMENT FOR BROCKTON RESERVOIR

SUB-AREA RUNOFF COMPUTATION

INFLOW TO BROCKTON LAKE

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
BROCK	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.80	0.00	3.37	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	111.00	124.00	133.00	0.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA
TP= 3.00 CP= .50 NTA= 0

RECESSION DATA
STRTQ= -1.70 QRCSN= -.10 RTIOR= 2.00

UNIT HYDROGRAPH 100 END-OF-PERIOD ORDINATES, LAG= 2.99 HOURS, CP= .50 VOL= .98

4.	14.	30.	48.	69.	91.	115.	141.	167.	194.
220.	243.	263.	279.	293.	303.	310.	313.	309.	299.
287.	276.	265.	254.	244.	234.	224.	215.	207.	198.
190.	183.	175.	168.	162.	155.	149.	143.	137.	132.
126.	121.	116.	112.	107.	103.	99.	95.	91.	87.
84.	80.	77.	74.	71.	68.	65.	63.	60.	58.
55.	53.	51.	49.	47.	45.	43.	42.	40.	38.
37.	35.	34.	32.	31.	30.	29.	28.	26.	25.
24.	23.	22.	22.	21.	20.	19.	18.	18.	17.
16.	15.	15.	14.	14.	13.	13.	12.	12.	11.

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q

INPUT (CONT.)

```
W      1     0.5
X   -1.7    -0.1       2
K      2    TOTAL                                                    1
K1        COMBINE HYDROGRAPHS
K      1    UPORT                                                    1
K1        ROUTED OUTFLOW FROM UPPER PORTER POND
Y                                          1       1
Y1     1                                                   -167.5     -1
Y4 167.5   168.5   169.5   170.5     171     172     173     174     175     176
Y5     0      78     219     403     508    1653    3584    6031    8900   12134
$A     0      11      19
$E   160   167.5     171
$$ 167.5
$D   171
K      0    LPORT                                                    1
K1        INFLOW TO LOWER PORTER POND LESS UPPER PORTER POND
M      1       1   0.08       0    3.37                                        1
P      0    21.5     111     124     133
T                                                        0.0    0.05
W    1.0     0.5
X   -1.7    -0.1       2
K      2    TOTAL                                                    1
K1        COMBINE HYDROGRAPHS
K      1    LPORT                                                    1
K1        ROUTED OUTFLOW FROM LOWER PORTER POND
Y                                          1       1
Y1     1                                                    -160     -1
Y4   160     161     162     163     164     165     166     167     168
Y5     0      75     248     488    2028    4748    8239   12353   17009
$A     0       8      24
$E   151     160     170
$$   160
$D   163
K     99
```

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

```
RUNOFF HYDROGRAPH AT        BROCK
ROUTE HYDROGRAPH TO         DAM 0
RUNOFF HYDROGRAPH AT        WALDO
COMBINE  2 HYDROGRAPHS AT TAL
ROUTE HYDROGRAPH TO         WALDO
RUNOFF HYDROGRAPH AT        UPORT
COMBINE  2 HYDROGRAPHS AT  TOTAL
ROUTE HYDROGRAPH TO         UPORT
RUNOFF HYDROGRAPH AT        LPORT
COMBINE  2 HYDROGRAPHS AT  TOTAL
ROUTE HYDROGRAPH TO         LPORT
END OF NETWORK
```

FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

FLOODS ROUTED THROUGH LOWER PORTER POND DAM WITHOUT BREACHING

INPUT

```
     1  A    HYDROLOGIC ANALYSIS OF LOWER PORTER POND
     2  A    NATIONAL DAM SAFETY PROGRAM
     3  A    NEW ENGLAND DIVISION - CORPS OF ENGINEERS
     4  B   300    0    10    0    0    0    0    0   -4    0
     5  B1    5
     6  J     1    9     1
     7  J1   .1   .2    .3   .4   .5   .6   .7   .8  1.0
     8  K     0   BROCK                              1
     9  K1      INFLOW TO BROCKTON LAKE
    10  M     1    1   2.8    0  3.37                      1
    11  P     0 21.5   111   124   133
    12  T                                          0   .05
    13  W   3.0   0.5
    14  X  -1.7  -0.1     2
    15  K     1   DAM 0                              1
    16  K1      ROUTED OUTFLOW FROM BROCKTON LAKE DAM
    17  Y                          1    1
    18  Y1    1                                -201.0    -1
    19  Y4  201   202   203   204 204.3   205   206   207   208   209
    20  Y4  210
    21  Y5    0    83   233   429   495  3675 12332 24050 38163 54317
    22  Y5 70278
    23  $A    0    85   126
    24  $E 194.3   201   210
    25  $$  201
    26  $D 204.3
    27  K     0   WALDO                              1
    28  K1      INFLOW TO WALDO LAKE LESS BROCKTON
    29  M     1    1  0.38  3.37                      1
    30  P     0 21.5   111   124   133
    31  T                                          0.0   0.05
    32  W  1.25   0.5
    33  X  -1.7  -0.1     2
    34  K     2TOTAL                             1
    35  K1      COMBINE HYDROGRAPHS
    36  K     1   WALDO                              1
    37  K1      ROUTED OUTFLOW FROM WALDO LAKE
    38  Y                          1    1
    39  Y1    1                                -194.5    -1
    40  Y4 194.5 195.5 196.5 197.5 198.1 198.5 199.5 200.5 201.5 202.5
    41  Y5    0    75   209   418   499  1500  6916 14786 24497 35743
    42  $A   77   137
    43  $E 194.5   200
    44  $$ 194.5
    45  $D 198.1
    46  K     0   UPORT                              1
    47  K1      INFLOW TO UPPER PORTER POND LESS WALDO LAKE
    48  M     1    1  0.11    0  3.37                      1
    49  P     0 21.5   111   124   133
    50  T                                          0.0   0.05
```

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
**********

RUN  DATE= 02/12/80.
     TIME= 10.36.59.

                    HYDROLOGIC ANALYSIS OF LOWER PORTER POND
                    NATIONAL DAM SAFETY PROGRAM
                    NEW ENGLAND DIVISION - CORPS OF ENGINEERS

                              JOB SPECIFICATION
      NQ     NHR    NMIN    IDAY     IHR    IMIN   METRC    IPLT    IPRT   NSTAN
     300       0      10       0       0       0       0       0       4       0
                    JOPER     NWT   LROPT   TRACE
                        5       0       0       0

                    MULTI-PLAN ANALYSES TO BE PERFORMED
                    NPLAN= 1  NRTIO= 1  LRTIO= 1

NO INFLOW --> RTIOS=   0.00

**********  **********  **********  **********  **********

                              HYDROGRAPH ROUTING

                    ROUTED OUTFLOW FROM LOWER PORTER POND

                ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                EPORT       1       0       0       0       0       1       0       0
                              ROUTING DATA
              QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                0.0   0.000    0.00       1       1       0       0               0

              NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                  1       0       0   0.000   0.000   0.000    -163.      -1

STAGE      160.00  161.00  162.00  163.00  164.00  165.00  166.00  167.00  168.00   } STAGE-DISCHARGE DATA FOR
FLOW         0.00   75.00  248.00  488.00 2028.00 4748.00 8239.00 12353.00 17009.00   } LOWER PORTER POND DAM

SURFACE AREA=    0.      8.     24.
CAPACITY=        0.     24.    177.   } STAGE-STORAGE DATA FOR
ELEVATION=     151.    160.    170.   } LOWER PORTER POND DAM

                CREL   SPWID    COOW   EXPW   ELEX   COOL   CAREA   EXPL
SPILLWAY CREST ELEVATION --> 160.0     0.0    0.0    0.0    0.0    0.0    0.0    0.0

                              DAM DATA
                TOPEL    COOD    EXPD   DAMWID
TOP OF DAM ELEVATION --> 163.0     0.0     0.0      0.

                              DAM BREACH DATA
              BRWID       Z    ELBM   TFAIL    WSEL  FAILEL   } BREACH DATA - FAILURE BEGINS IMMEDIATELY
                20.     .01  156.00    1.00  163.00  163.00   } WITH RESERVOIR SURFACE AT TOP OF DAM

HRBRK= DAM FAILURE AT   0.00 HOURS  --> PEAK BREACH DISCHARGE
PEAK OUTFLOW IS      AT TIME   0.01 HOURS
```

HYDROGRAPH ROUTING

LOWER PORTER POND BREACH THROUGH THIRTYACRE POND

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
TPOND	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-154.	-1

STAGE	154.00	155.00	156.00	157.00	158.00	159.00	160.00
FLOW	0.00	23.00	122.00	285.00	1951.00	4934.00	8775.00

STAGE-DISCHARGE DATA FOR THIRTYACRE POND DAM

SURFACE AREA=	26.	37.
CAPACITY=	0.	188.
ELEVATION=	154.	160.

STAGE-STORAGE DATA FOR THIRTYACRE POND DAM

SPILLWAY CREST ELEVATION → 154.0

CREL	SPWID	COOW	EXPW	ELEVL	COOL	CAREA	EXPL
154.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOP OF DAM ELEVATION → 157.0

TOPEL	COQD	EXPD	DAMWID
157.0	0.0	0.0	0.

PEAK OUTFLOW IS 71. AT TIME 1.83 HOURS

↳ ROUTED OUTFLOW AT THIRTYACRE POND DAM DUE TO BREACH OF LOWER PORTER POND DAM

HYDROGRAPH ROUTING

CHANNEL ROUTING TO HAZARD CENTER

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
HAZARD	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1.	0

NORMAL-DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0800	.0300	.0800	138.0	150.0	1200.	.00800

ELNVT → CHANNEL INVERT ELEVATION

QN(1), QN(2), QN(3), ELMAX, RLNTH, SEL } CHANNEL CHARACTERISTICS AT DOWNSTREAM DAMAGE AREA

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 150.00 540.00 140.00 543.00 138.00 555.00 138.00 558.00 140.00
1100.00 140.00 1700.00 145.00 2300.00 150.00

} CHANNEL CROSS-SECTION AT DOWNSTREAM DAMAGE AREA

STORAGE	0.00	.23	.48	.77	9.61	21.90	36.11	52.22	70.25	90.19
	112.05	135.81	161.49	189.08	218.58	249.99	283.32	318.56	355.70	394.77
OUTFLOW	0.00	25.09	80.84	161.54	1004.34	3526.43	7268.17	12147.89	18133.02	25212.25
	33385.64	42660.04	53046.66	64559.63	77215.15	91030.89	106025.57	122218.70	139630.39	158281.17
STAGE	138.00	138.61	139.26	139.89	140.53	141.16	141.79	142.42	143.05	143.68
	144.32	144.95	145.58	146.21	146.84	147.47	148.11	148.74	149.37	150.00
FLOW	0.00	25.09	80.84	161.54	1004.34	3526.43	7268.17	12147.89	18133.02	25212.25
	33385.64	42660.04	53046.66	64559.63	77215.15	91030.89	106025.57	122218.70	139630.39	158281.17

STAGE-STORAGE AND STAGE-DISCHARGE DATA FOR THE DOWNSTREAM CHANNEL

MAXIMUM STAGE IS 139.1 → STREAM ELEVATION AT DAMAGE CENTER

....

LOWER PORTER POND DAM
BREACH RESULTS

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	163.00	160.00	163.00
STORAGE	54.	24.	54.
OUTFLOW	488.	0.	488.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.00	162.93	0.00	54.	488.	0.00	0.00	0.00

→ PEAK OUTFLOW DURING BREACHING

SUMMARY OF DAM SAFETY ANALYSIS

THIRTYACRE POND DAM

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	154.00	154.00	157.00
STORAGE	0.	0.	86.
OUTFLOW	0.	0.	285.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.00	155.49	0.00	40.	71.	0.00	1.83	0.00

DAMAGE AREA → PLAN 1 STATION HAZARD

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.00	71.	139.1	1.83

STREAM ELEVATION AT DAMAGE AREA

STREAM FLOW AT DAMAGE AREA

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE	(2) IDENTITY NUMBER	(3) DIVISION	(4) STATE	(5) COUNTY	(6) CONGR DIST	(7) STATE	(8) COUNTY	(9) CONGR DIST	(9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY | MO | YR
MA	420	NED	MA	023	11				LOWER PORTER POND DAM	4205.0	7102.0	04JAN80

(13) POPULAR NAME	(14) NAME OF IMPOUNDMENT
	LOWER PORTER POND

(15) REGION	(16) BASIN	(17) RIVER OR STREAM	(18) NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	(19) DIST FROM DAM (MI.)	(20) POPULATION
01	06	BEAVER BROOK	BROCKTON	0	90000

(21) TYPE OF DAM	(22) YEAR COMPLETED	(23) PURPOSES	(24) STRUC HEIGHT (FT.)	(25) HYDRAU HEIGHT (FT.)	(26) IMPOUNDING CAPACITIES MAXIMUM (ACRE FT.)	(27) NORMAL (ACRE FT.)	DIST	OWN	FED R	PHV/FED	SCS A	VER/DATE
REPG	1932	R	12	12	54	24	NED	N	N	N	N	

(28) REMARKS

(29) D/S HAS	(30) SPILLWAY CREST LENGTH	(31) SPILLWAY TYPE	(32) SPILLWAY WIDTH (FT.)	(33) MAXIMUM DISCHARGE (FT.)	(34) VOLUME OF DAM (CY)	(35) POWER CAPACITY INSTALLED (MW)	(36) POWER CAPACITY PROPOSED (MW)	(37) NAVIGATION LOCKS NO	(38) LENGTH (FT.)	(39) WIDTH (FT.)	(40) LENGTH (FT.)	(41) WIDTH (FT.)	(42) LENGTH (FT.)	(43) WIDTH (FT.)	(44) LENGTH (FT.)	(45) WIDTH (FT.)
2	200	U	32	488	750											

(46) OWNER	(47) ENGINEERING BY	(48) CONSTRUCTION BY
BROCKTON DEPT. PARKS + REC.	UNKNOWN	WORK PROJECTS ADMIN.

(49) REGULATORY AGENCY DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	MA DEQE	MA DEQE

(50) INSPECTION BY	(51) INSPECTION DATE DAY | MO | YR	(52) AUTHORITY FOR INSPECTION
O'BRIEN + GERE ENGINEERS INC.	17OCT79	PL 92-367

(53) REMARKS
COMBINED SERVICE + AUX. SPILLWAY LENGTHS AT SAME CREST ELEV.

END

FILMED

7-85

DTIC